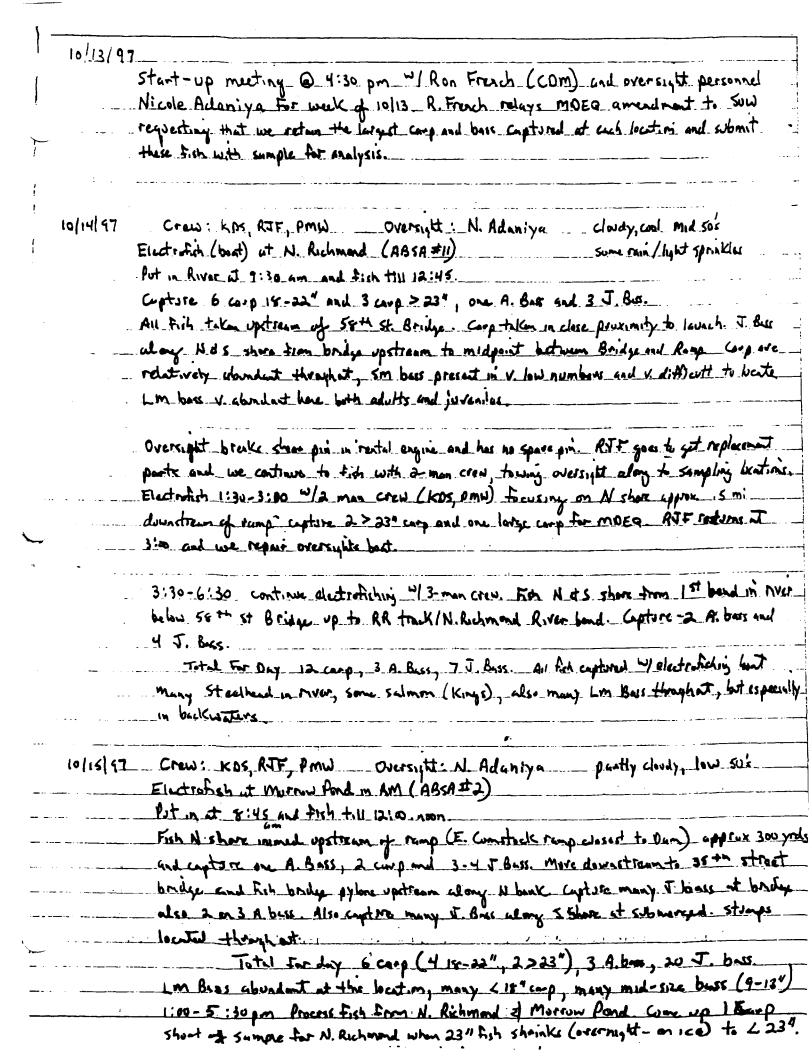
Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site Kalamazoo, Michigan

Final Technical Memorandum 14 Biota Investigation

Appendix I Data Quality Review Reports Turtle Tissue Analytical Results

January 2002

Technical Memorandum



Total To N. Ros, Rot, PMW N. Adaniya - Oversight Cloudy, warm mid 505
Electrofish at N. Richmand (ABSA#11) 10:00 am - 4:00 pm
Begin Fishing at 1st side channel into Morrison Bayou (S. Shore) downstream from range Fish both
Md 5 shore in general vicinity of this side channel (approx 25 mile). Culent 2 A. Bass sid
remaining jureale bass (18), also called 1 > 23" cang Culect 2 additional A. Bass Frithin
upstream at backwater even next to factory intide (1st boul upstream of side chance).
All fish captored of electrotic heigh but
5:00 pm-7:00 pm process J. Bus. taken from N. Rehmond
10/17/97 Crew: KOS, ROF, DMW N. Aleniya - Oversight cloudy, wol, mid 50's
Lulle Allegan 9:00 am- 12:30 pm_ (ABSA#9)
Electrofish in 2 small cutes across (also From laurch site. (S. Share), continue Fishing S. Short
upstream to sandy point midway in later. Capture 5 camp 18-22", 3 A. Biss and 6 V.
Buss. All carp are v. small, 27 ff cutt to locate indiv > 18". Small to mid-size bus 19-12-1
abundant, largement base also relatively abundant
All fish captured Welectrofishing bout
1:00- 5:30 pm process Fish from 10/17 (Lake Allegan) and 10/16 (N. Richmond).
[10/20/47 Crew: KOS, DKR, PMW R. French & Ian Gilis - Oversight Cloudy, curl, high " Flectrofish at Marrow Pond t2:00-6:30 pm. Pat in at 53rd St. Bridge, from 50 yrds downstream of bridge (both banks) and along N store to Dan Breet, across breet and along downstream 1/4 of 5 Share. Juvenile bass are numerous and Sample is ensity completed. Cusp are numerous and we complete carp sample. A base captured at bridge, inmuch upstream of bridge and along remainder of store. Many undersize individuality (4-12 in), individuality than 13" in length difficult to locate Also many LM But > 19" LM more common than SM. Also observed soveral (3-4) large Walleye during collection afford.
Totals for Day: 2 cup 18-224, 5 cup >23°, 6 A, Buss, 1 v. Auce composite (5 indiv.).
were higher them most other sampling locations. All fish captilled Welector Fishing boats
10:00 am - 6:30 pm I. G:11ic - Oversight ptly same, would, chappy Mill 409
Electrofish almost outire holischore beginning 4/5. Share over across from boat ramp. Again have
success in channel landing to 1st core. Jee no lung > 23" curp, Finish sample of 18-22" curp. Also
* difficult to locate coop > 15" in length 5m numerous in lake but most were 9-13". Small month take
was split upprox solso N. Shore 48. S. Shore Many Juvenile Son taken along Replace Along Allegan Va
Rundom pather of structure (mostly submurged) again is most productive for A. SM Base. LM Sass not
so numeros, only one logal Walleys observed during entire day.
Electrified 2/ 2 mm craw from 12:0-2100. Throat craw member aided overright in afforts to get

oversight engine repeared. Sheep priched again broken and jamuel into peop college we could not fix in
Field. We could not get any in repaired and had to fow oversight for remainder of day. Totals for day: I corp 15-22", I would best 3 I have composites (15, rediv). All tich captured we electrofishing boat
Topal 97 Crew: KOS DKR PMW Dietsight: I, Gillie Lloudy light snow showers high 30's
Am - Process tick from Moran Pand and Lake Allegan. wait over 2 my for oversight to acquire her
Pro- Check mi Plummen Dam Access and decide against going into Planmen claim due to late start me considerable effort needed to clear access to move behind from. Put in at Lake Allegan (4:00-7:00) we
collect remaining 2 A. Buss and y J. Base to complete to Allegan sample. A base taken at yetran
downstream love (5. show) and upstream from comes along 5. shore. These taken along 1911yan Univ
Rd replace and whom it shows downstream of rocky pt. Totals For Day: 2 A. bass 4 indir J. Bass putich suprised wellottofishing bouts
10/23/97 Crow: KDS, OKR, PMW Brensight: I Gillie Cloudy mid 4015
Planuell Dan (9:30-5:30)
Clear across and put into River next to Puell Dam spend Am alectratisting Lituren Dam and
Qt. 131 Bridge Coptore 411 A. Back (all in 135-155" Size limit), All J. Back (25 indir) and
ull large corp >23" plus 2 18-22" indiv. Bass ubadant throughost this reach of Rever bit
adults and jurales). Large way also shoulent throughout. Smaller carp < 22" v. difficult to
locate. In PM negotiate regards at 131 flenday and fish upstream of bridge to Hayawell
WWIP artfull to critise ramaining 4 15-22" Curp (this after another 1.5 hrs - spent trying
to locate this size fish in original reach from Dam to 131 Bridge). Get pulled at of Access
by Devis towing Totak for Day: 6 curp 18-22", 6 curp > 23", 12 bus amportes (251)
10/24/97 Crew: KOS, OKR, PMW Overyth: R. French wary med 405.
N. Richmod (10:30-12:30)
Electrofish N. Richmond bouton in attempt to capture 2 A. Buse required to complete sample A
this location. Run down to 1st side channel into marrison Bayou and fish structure in vice
I this at 1/hits 1/2 Country as constitle size A fless for in to sample in visit
of this channel (both banks). Cupits re no scraptible size A Bass Run up to sample in visionit
of N. Share backer to are we captured beer 10/16 and cald not fish area because of
prosonce of one indivinue was fishing in the war we wanted to ship. Fish Dutton upstroum
and again capture no Keepen A Bress Try fichiag at 55th st bridge of similar results (10
Kupo 5)
1:30-5:30 Process Feb from 10/22 110/23

-10/27/97 Crew: KM, DKR PMW	Oversitt: Nicole Adamiya	Clarity, cold high 305
Electrofish et N_Ruhmande From 2:30	-5:00 pm	sain on ground.
tracks and back up to Romp of bridges. Confrom bridge (s) immed uprotream of con	ptore 2 Adult base to complete M. Richmo	
-10/28/97 Crew: KOS, DKR, PMW	Oversight: N. Adantya	clardy, cool much 405
to point were 93 sampling afforts extended t	1 St Bridge flows on Bridge pylons and to Cappiox 20 yods upstream of Bridge with	1 aren inned experience 14 maluk. Fish along N
brak of lake, see ne Keepers, More on to		
3 under in this area, all sumblet small. Discontinue Sampling affort after additional morrow Pond sample is complete W/reteat.	fishing along N. Shore From Dam Broit	
Beyin sampling at Buttle creak. Fish from - river approx. Us mile and work our way	· · · · · · · · · · · · · · · · · · ·	Purk More down
12 indic > 13.5 inche_also take 9. J. 1	Bass. So no carp throughout extine time m	n. Riven. Jiscenthave
sampling early to check in Generator H		
and mosses in , Battle Creek	The bond and therese we	h+timpT. Nichman
	Oversight: N. Adamiya	Sumy, weren Midebook.
Ast in at Apole and electronic	the strong constant was promitted and area	In Invest. Viertity of
and also 5 additional Adult buse (in fi	referral size was a liveble exemined them	efforts to locate time!
2 juvenile bes Remove boat from water	and talk to shop for anging chek.	Go back to Full Office 1
und precess fich from today. Again see	no carp wany entire day/morning of a	dectrofiching
_10 30 47		- the contest
Receive news from Marina that engine	comet be repaired by this afternion. De	cide to end sampling 1
lo 30/17	men repaired. Leave site	
-	<u> </u>	
11/10/97 Crew KOS. OKR Elastrofish et Corrosco Res 1	Oversight: Nicole Adamiya	Surary cold high 30°
	traum past old Bridge abotheuts and	capture entire curp
sample from upstroum reaches of the in	(5.54 sto) -pointment. Asspor parts of the impaintment	unt include s. share
(upper roach), almost the entire lower	ana is v. shallow (42 ft deep) and	difficult to navigate
Overrytet dul not have boot and me d	Proposed N. at N. shore Bridge abstinant stad, ast winched at it access by Ro	to observe collection
ACTIVITIES ATTE CORRESPONDE COMPLE	fight, gail wintings and us access $y_j = x_i y_j$	CMY'S WINCKING.

Kalamazoo River Fish Collection Field Data | 997



Attachment A-1

Fish Collection Field Data Sheet

BLASLAND, BOUCK & LEE, INC.

Collection Time 10 Down-6 with		
Collection Date 10/14/97		
Water Body Kzn Rivin		ķīf
Sampling Location N. Richmad ABSA#11	Collected By	KOS SET FOU
Processed By KOS EXF ANN	Odiverality.	Nicha Adom ve
Sampling Method Electic Liching But		
Dimension and Mesh Size of Seine (if applicable	∍)	

			Total	Weight		Sample	
	Sample #	Species	Length(cm)	(g)	Gender	Туре	Comments
	K40500 .	SM BASS ALAH	4.3	1000		FileT	MARKE
	140501	Sm cass Adait	44	1300		Filet	NM
*	149502	5m Pacs Hot	39 0	550		11	NM
	K40503-C	Sim Base Jul	18	74		Windy Compacte	المر. ٧٠.
			30	90		1	y.n
			' 15	75			(/. Y¹
			17	58			N.M.
		<u>J</u> .	17	75		1	
	Kunso#-Cl	om Base Juy	!7	61		W mily	NN
	n	19	; 19	95	<i>6</i> .	it	V.M
*	K40505	Adult Corp	70	5.8 (1		F. Het	MiniC
	K40506	Adust Corp	66	6.1 Kes		7.11.2	NM
	K405.07	Adult Corp	59	3.0 /4		Filat	Nm
	1443503	Adult Carp	60	33 44		F.IIc+	b '.∧¹
	1440504	Adsil Corp	65	4.0 164		F.IL+	<i>V.</i> m
	K40510	Edust Corp	57	29/64		FILET	V.~;
	K40511	Adult Cocp	55	3.5 6		Ellet	NY
	K40512	Adult Carc	52	2.1 Key		Fillet	NM

^{*} Max Fish Collected par mora Riquist

^{*} Within Size Betroom For Sin Plans

Collection Time 10.00 cm - 6 12 pm	
Collection Date 10114/47	
Water Body <u>หรองเพล</u>	
Sampling Location New Richmond AGSA #11	Collected By Kis KIF 2mi
Processed By KOS FMW	Oversight ! Nicole Adamya
Sampling Method <u>Electofehing</u>	
Dimension and Mesh Size of Seine (if applicabl	e)

Sample #	Species	Total Length(cm)	Weight (g)	Gender	Sample Type	Comments
K40513	Adul Con	53.5	1.9 Ki		Filst	Muriky
K43514	Adult Coop	495	1.7 /4		5110	KM
149 515	Adust Comp	50	2.2 /4		¥.11€±	NM
K40516	Adust Cocp	51.5	1.9 Kg		HILT	merics.
			IJ			
<u> </u>						
				*		
·						
						

Collection Time 9:20 cm - 13:30 pm	
Collection Date 10/15/67	
Water Body / Zn River	
Sampling Location Morrow LIC ABSE # 2	Collected By KOS KIT PAIN
Processed By KOS Fmw	Orestant Ville Adenty
Sampling Method Electofiching	
Dimension and Mesh Size of Seine (if applicable	

Sample #	Species	Total Length(cm)	Weight (g)	Gender	Sample Type	Comments
K40517-C	Juvenia Strans	5	दुःभ		W - souly Compación	NW
	0	19	91		i,	NM.
	l)	14	34		n	Nm
	il	, کو	37		i/	ym
4	31	18	79		0	N.M.
K42514 C	Juvenil Smins	18.5	76		in rady Corpora	vm.
	1	16	52		1	Nw
		14.5	40			ym
		14.5	35			N.M
1	1	15.5	18	•	<u> </u>	NM.
K45519-C	Turante Smiless	15.5	46		Composite	Nm
		15.0	40		<u> </u>	NM
		19.5	94			1,00
		16.0	Si			#M
<u>_</u>	1	14.5	39		1 1	N.M.
K +2522-6	Juliania Simples	, 14	73		Commy to	NM
		19	90			
		16	50			

Collection Time	9:00 Am - 12:00 Pm	_	
Collection Date	10/15/97	_	
Water Body	Ken Riw-		
Sampling Location	n Miron Pond	4BSA #2	Collected By KDS, RDG, PMW
Processed By	KDS PMW RJF		oversight Nicele Adanys
Sampling Method	Electrofishing	· · · · · · · · · · · · · · · · · · ·	•
Dimension and M	lesh Size of Seine	(if applicable	e)

Sample #	Species	Total Length(cm)	Weight (g)	Gender	Sample Type	Comments	
К 46520 C	Juranie Sm. Basa	15,5	44		W-may Companie	V.M	
11	71	13	27		11	11	
K40521	Adurt Carp	53	2.0 Keg		Filets	Between are 27 &	K
K40522	Adult Coop	53	a.l K.		Fillis	Musice.	
K40523	Guil Crop	62.5	3.616		Tillete	min Cop Pa	
K45524	4dolf (4-p	53.5	36K.		Filet	Vn	
K40525	Adult Gara	54.5	2.3 Ki		Fillet	NM	
K 40526	a but Carp	52.0	1.8 Kg		F.ilit	NM	
K40527	Adolf Biss	ن. 33	570		Fillet	いっとり	
K 40529	Adult Bass	45	1.2 k	6 .	Fillel	NM	
K 40529	Ad-it Besi	33.5	1.2 kg		-16 t	VM	
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							-
		· · · · · · · · · · · · · · · · · · ·					

OKEMOS PUBLIC SCHOOLS

SCHOOL CALENDAR 1998-99



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Parent/Teacher Conference Days
Inservice/Record Keeping Days

IMPORTANT DATES FOR STAFF AND STUDENTS

August 27	Planning Day/No School All Day	March 3	K-5 Inservice Day, No School PM
August 28	No School All Day		6-12 P/T Conferences, No School PM
August 31	1st Day School for Students	March 12	End of Middle School Trimester
August 31	K-12 Records Day, No School PM	March 26	End of Third Quarter
September 7	Labor Day	March 30	K-5 P/T Conferences, No School PM
October 6	K-8 Inservice Day, No School PM		6-12 Inservice Day, No School PM
	9-12 P/T Conferences, No School PM	April 1	K-12 No School PM
"Weeks of Oc	t 5 & Oct 12, 9-12 P/T Conferences	April 2	K-12 No School All Day
	26 & Nov 2 K-8 P/T Conferences	April 5-9	Spring Recess
October 26	K-8 Records Day, No School PM	May 3	K-8 Inservice Day, No School PM
40.250. 2 0	9-12 Inservice Day, No School PM	May 31	Memorial Day
October 30	End of First Quarter	June 8	9-12 Records Day, No School PM
November 3	K-8 P/T Conferences, No School PM	June 9, 10	K-12 Records Day, No School PM
	9-12 Records Day, No School PM	June 10	Last Day School for Students
November 6	K-12 No School PM	June 11	Planning Day, No School All Day
	End of Middle School Trimester	June 11	End of Second Semester & End of Middle
Nov. 26, 27	Thanksgiving Recess	V U U U U U U U U U U	School Trimester
Dec. 23-Jan. 1			
January 4	School Resumes		
	9-12 Records Days, No School PM	CODE:	⊘ Planning Days/No School Days
January 15	K-12 Records Day, No School PM		/ Holidays, Vacation
	End of First Semester		End of Quarter/Trimester/Marking Period
January 15	FIG A LIBY CRITERIES		C Demol/Teaches Confessor - Dave

Collection Time 10.00.4m - 4.30/M	
Collection Date 10/16/47	
Water Body Kroe River	
Sampling Location New Richmont (April #11)	Collected By KDS RJE Palin
Processed By \$405, 125F, Pinus	Oversignal Alicik Adminy.
Sampling Method <u>Electrofishing</u>	
Dimension and Mesh Size of Seine (if applicable)

Sample #	Species	Total Length(cm)	Weight (g)	Gender	Sample Type	Comments
K40504-CZ	Jur Sim best	15.5	54		Composite	NAI
	"	15.5	50		1	NA
¥	- 11	18.0	75		1.1	NM
K40530-C	Jur Sm bess	' 9. C	82		Composit	<i>U.11</i>
		17,0	62		1	Un
		16.5	60			NM
		17.5	62			NN
<u> </u>	*	17.0	58		¥	Nn
K40531-C	Ju Sm. bess	18.0	73		Whaty Conjus	
		15.5	46	6 .		NN
		18.0	78			NM.
		20.0	100			NM
*	X	18.0	86		V	NM
K 40532-C	Jur Ja ben	18.C	78		Canyo's.	.Vm
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		17.0	(do			1 in
		17.0	63			vin
	-ie	15.0	45		Ł	N.n

Collection Time 9 39 12 15 pm
Collection Date 1011-197
Water Body Lake Hogen 1852 # 9 Kzcc River
Sampling Location Leki Allen A35449 Collected By KOS, RJR. PINCE
Processed By Kos RIF, fine Oversight Which Adaniya
Sampling Method Elecationing
Dimension and Mesh Size of Seine (if applicable)

Sample #	Species	Total Length(cm)	Weight (g)	Gender	Sample Type	Comments
K40533-C	Jus Sm Bas	19.5	90		(ongos, ty.	NM
		18.5	78			NM
•	1	18.5	85			NM
		18.5	67			NM
	1	17.0	56		k	NM
K40534-CI	JUV Sin Bress	17.5	58		W-bod comp	NM
K40535	Adult cap	50,0	1.7 K		C. Net	scar on left operculain
K40536	Adult Carp	47.5	1.1 6		FILE	olumnions
K40537	Adult Carp	46. 5	1.1 Kg		Filet	ulure tions
K40538	Adult (a-p	41.5	1.4 K	5 %	FILLY	NM
K40539	Adult (arg	46.5	1.314		F. Ilet	NA
K40540	Adult Sm. Biss	37.5	680		Filet	viles as A.A. L. A
K40541	Adult Sm. Basi	3 <i>9</i> .0	580		Fillet	NM
K00542	Adu H SA BOX	36.0	590		Filet	pealed was

Collection Time 10:00am- 430 pm	-		
Collection Date 10/16/97	_		
Water Body Kran River			
Sampling Location <u>Veri Richmod</u>	ABSA# 11	Collected By	
Processed By KD RJF PMW		oversint	Nicelle Adminy
Sampling Method Electro Filip			
Dimension and Mesh Size of Seine	(if applicable)	

					Mindre Lendarina	December 1990 Black Com
		Total	Weight		Sample	
Sample #	Species	Length(cm)	(g)	Gender	Type	Comments
K40543	Adult Corp	63.5	3.7 k ₂		Fillet	Missils
K40544	Adult Sin Bir	41.0	1.1 /4		F. Ilet	NM
K40545	Ad Sm Bass	39.0	1.1 kg		Filet	L. Mandible
K40546	Adult Sm Bass	36.5	770		Fillet	NH
K4C547	Adril Son Bex	38 o	880		Filet	NM
K40548	adult SmBer	35,0	640		Filet	NM
11	Abult Son Box	40.5	1.2 Kg		Fillet	NNI
Į.	AL. H Sa Ben	33.5	570		Fillet	
			-			

Collection Time 12/2 pm - 5 3/20	
Collection Date <u>missis</u>	
Water Body M Kan Rose	
Sampling Location Markow Luke	Collected By Kir okt 20 4 3/24/7
Processed By Kos AKR SAN ICLEANS	Inn (5) 1 - 5 - 5 - 10 - 5
Sampling Method Excession But	
Dimension and Mesh Size of Seine (if applicable	e)

	Sample #	Species	Total Length(cm)	Weight (g)	Gender	Sample Type	Comments
	K40551=C	Judenik < 17 Pm	. 4. 5	43		With Charge	N' M
	<u> </u>	į .	.3 5	3.1		ĺ	U VI
		i		2 to			y N
	·		12.	.47			Ç v
			1ê 5	24		<u> </u>	:/ v 1
	KHOKKZ	Adut Co-a	70	1.5 Cm		SK17-376 F. 11-5	1/11
	K45553	11	59	3,900			Marice
	KHOSKH	; (725 730	4916.1			100
	K11-855	, i	51.5	20 64	r	,	Marile
	K40355	11	47. 3	. ÷ v			$A_i^{(i)}$
	K45557	1.0	63	10.7)	i .v.;
Ж	,	Adot See	***	1316		\$K.9-57	y Carl
1	K43559		30.5	450 -			n (-
	K 42560	, (32.5	5.50			G,N
П	K 40561		34 6	450 ./			V. W
- -	K40-62	11	24. 9	140 m			(1.00)
Ш	K-0563	it	34. <i>5</i>	101			
)			

Collection Time 13 to man 15 to man	
Collection Date	
Water Body <u>Kara Sira</u>	
Sampling Location <u>Late Ausgan</u>	Collected By Yes 200 300 000 00
Processed By KEK NER FULL 10132197	In Girls - on Okonit
Sampling Method = :	
Dimension and Mash Size of Saine (if appli	achie)

		Total	Weight		Sample	
Sample #	Species	Length(cm)	(9)	Gender	Type	Comments
KHOKEH-C	JUNE 185	40	1.3		Computates 1964- Mark	.V-r!
i .		19.5	ac			Vin
		15.	78			NW
<u> </u>		15	33			1/2
	/	, د	કડ			17.17
K40545-C	Julianle Bass	19 19	∂4 60,3		lost.	Thin had also
		J# 30	103			<u>!</u> / m
	!	18	71			u M
:		18	67			11 11
	/	15.5	-17	e .		0.20
K-10<66-C	Jel smales	16 C	54			Marica
	I	<u> </u>	47			4.00
		55	43			11.00
·		5.5	42			NV
<u>~</u>		50	40			Nac
4-10567-6	JUL SIN Bess	0.5	44			NIM
	i	il. 0	(7.0			42%
ا م		ii. o	130			W.29

Collection Time 3/45-1/15			
Collection Date 10/25/47			
Water Body Kalomeza King			
Sampling Location Morma Like	ABSA==	Collected By	KOS OKA DML
Processed By KOS JKR			N. Adamya - Cversight
Sampling Method Fladeling But			
Dimension and Mesh Size of Seine (i	f applicable)	

Sample #	Species	Fotal Length(cm)	Weight (g)	Gender	Sample Type	Comments
K40615	Adut miss	33.0	430		F. 11. ts	1/m
K45616	Adut Sn Bass	3/. 5	490		2.	NM
143617	Adult Sm Buss	34	550		"	Nin
				•		
· · · · · · · · · · · · · · · · · · ·						
	·					

Collection Time <u>202-4:3C</u>		
Collection Date 10/28/97		
Water Body Kaisman River		
Sampling Location And Cont		KOS CKA DAW
Processed By MF CAN		N. Aden you Eversia t
Sampling Method = Sithing Rul		
Dimension and Mesh Size of Seine (if applicable	e)	

Sample #	Species	Total Length(cm)	Weight (g) Gender	Sample Type	Comments
1540618	Adult For Ass	45	1.3 Kg	Flate	ym
Kyséra	Adul Sir Pass	46	1.4 Kg	,,	NM
1643620	Adult Smass	45	12/6	"	1/11
Kussai	Aduit Sin Gage	45	1.5 1/4	"	V:n
Kunina	Adi it Sin Page	45	1.2 Kg	/ 1	./m
K40623	Alli < in Bass	ųų	1.2 Kg	11	N M
K40624	Adus Son Pass	40.5	1.144	17	VM
KUSEZS	100	36	740 g	11	11/m
K40626	<i>n</i> 0	34	510 y	"	NM
Kungan		37	730 g	./	Vm
K41638	!	35.5	870 2	,,	1794157 -05
K42629	A	44,5	1.3 144	1	MN
K-13630-C	Ju Marie Carles	i d	21.5	Composition	y,n
ı	;	445	37		:
		5.5	5a		
		4	52		
1	1	.7	60		4
K40631-C1		18.5	80	whole-buty Composite	1/1/

Collection Time 2004-40 M		
Collection Date 19/38/97		
Water Body Kz River		
Sampling Location <u>Bettle Coult ABSA#1</u>	Collected By	HOS DER PMIN
Processed By <u>W5 2mw</u>		N. Adamyr - Coursignt
Sampling Method Electrick But.		
Dimension and Mesh Size of Seine (if applicab	le)	

Sample #	Species	Total Length(cm)	Weight (g)	Gender	Sample Type	Comments
K40631-Ci	Turenti smais	16.5	56		Composito	Nin
	i	165	53		İ	1
<u> </u>		11	35			

Collection Time 913 cm - 1315
Collection Date 10/22/2-
Water Body Ritte Creek
Sampling Location Kalendros River Collected By KOSOCR / FML
Processed By
Sampling Method Electrofishing Bost
Dimension and Mesh Size of Seine (if applicable)

Sample #.	Species	Total Length(cm)	Weight (g)	Gender	Sample Type	Comments
40631-CZ	Ju. Sn. Bres	13.5	30		Comparis	NM
40632-C1		15.5	67		whole Bong	NM
		16.5	58		1	!
		15.5	45			ı
]	15.5	73			
	V	14.0	35		1	V
40633-61	Juv. Sm Bare	17.5	アン		While Budy Companie	MAI
	1	16.5	6 2-			
		14.5	37			ı
		13.5	32	.	!	
		13.0	27		Ų.	V
140634-61	Ton Sun Ess	15.5	61		White BA	11150
	l	16.0	E.J		÷	,
	1	15.5	401			
		15.0	15			
	· •⁄	14.5	37		7	J.
K40635	Ad 5m. B-55	34.,	740		Fillet	NM
K40636	AJ Sm. Bass	37.5	1100		F. //e +	NN

FISH COLLECTION FIELD DATA SHEET

Collection Time 7/20 == - /Z	
Collection Date 10/29/97	
Water Body Karamanan Roya	
Sampling Location Bartle Creek Collected By X05/DKR 10x	? 20
Processed By DKR/PMiv	
Sampling Method Freetre fishing Feat	
Dimension and Mesh Size of Seine (if applicable)	

Sample #		Total Length(cm)	Weight (g)	Gender	Sample Type	Comments	
K40637	Ad. Sm. Best Ad. Sm. Best Ad. Sm. Best	3%.5	1100		Fillet	NM	·
K40638	Hd. Sn. 300	36.5	750		Fillet	NM.	
K40639	12 Sr. Base	35.0	650		= ile+	NM	11326 17
		t di					
				6 .			

Collection Time 1:30-2:30	
Collection Date ///10/97	
Water Body Kzo River	
Sampling Location Circle Ros	Collected By KIK UKR
Processed By <u>KDC IJKR</u>	My Nicile Adamya Descripti
Sampling Method Floot of clary full	
Dimension and Mesh Size of Seine (if applicable	e)

		Total	Weight		Sample	
Sample #	Species	Length(cm)	(g)	Gender	Type	Comments
K40640	Curf	54.0	2200 4		F-11cts	Mosks
K40641	" "	57.5	26 Kg		ע	NM
K.40642	. "	57.0	3.0 160		1	11:07
K43643	// -	60	3.0 Kg		"	NM
1540644	<i>"</i>	59.5	3.2 Kg		//	Nm
K406.45	,,	<i>5</i> 3	2.3 Kg		"	NAT
K40644	"	60	3.11kg		"	N'M
K,436,47	Ü	59	2.6 Kg		"	NM
1642448	11	50	1.8 Kg		,,	1/27
15.006.19	//	54.5	2.4 Kg	ø.	,,	NM
KU1450	1)	53	2.5 Kg		٠,	NM
K43651	′/	51	2.2Kg		7,	Vm
	_					
<u> </u>						

Attachment A-3

Carp Fish Condition Survey Form

BLASLAND, BOUCK & LEE, INC.

engineers & scientist.

Species	Fish No (s). <u>K43513</u>
Collection Date	Length
Collection Site	Weight
Q_11 #1	Collection Method
Photographs: (es) No Frame No(s). 16	
Age of Fish Spine, Scale, Ray	Preserved: Yes No
	Sure not pretering one

Species	Fish No (s). 1440516
Collection Date	Length
Collection Site	Weight
	Collection Method
Ki # Photographs:(Yes) No Frame No(s	s). <u>/4</u> Description
Age of Fish Spine, Scale, I	
	parasite encyctail in Anni Cin

Species	Fish No (s). <u>K45521</u>
Collection Date	Length
Collection Site	Weight
	Collection Method The No(s). 24 Description Scale, Ray Preserved: Yes No
	is colvition

1	Species	Fish No (s). <u>K 40522</u>
	Collection Date	Length
•	Collection Site	Weight
İ	الم الم الم الم الم الم الم الم الم الم	
	Age of Fish Spine, Scale, Ray	Preserved: Yes No
5 12		

Species	Fish No (s). 14 70623
Collection Date	Length
Collection Site	Weight
Photographs: (Yes) No Frame No(s). 26.	Collection Method
Age of Fish Spine, Scale, Ray _	Preserved: Yes No
	Raines Balance Eye Parasite Parasi

Species	Fish No (s)
Collection Date	Length 50 cm
Collection Site	Weight 1.7 Kg
R 01/2	Collection Method _ Electrofich
Photographs: (Yes) No Frame No(s). 8	
Age of Fish Spine, Scale, Ray	Preserved: Yes No
gar on L. operiuln	
	pluretions

Species	_ Fish No (s). <u> </u>
Collection Date	Length
Collection Site	Weight
	Collection Method
Photographs: Yes No Frame No(s)	. 9 Description
Age of Fish Spine, Scale, Ra	ay Preserved: Yes No
	viuntions on underside - could be due to electrofishing
	The state of the s

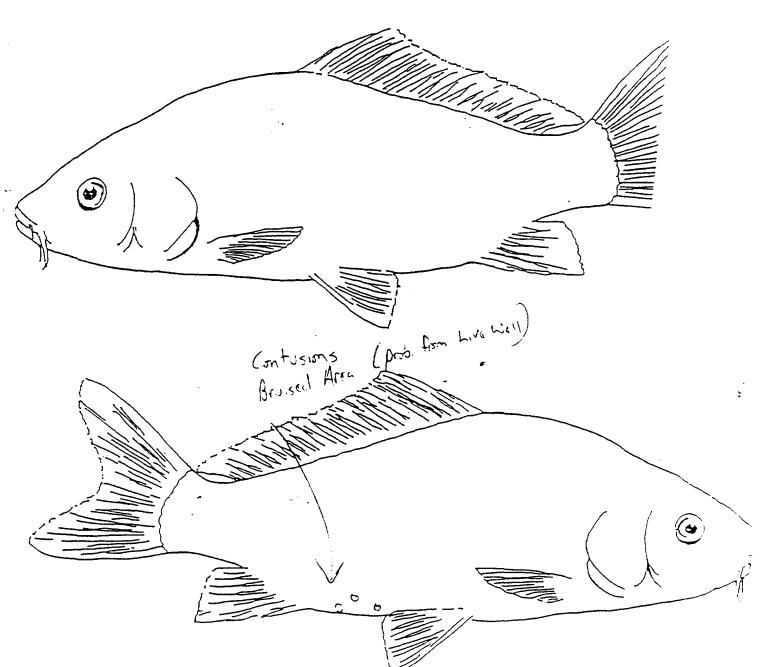
Species	Fish No (s). $K90537$
Collection Date	Length
Collection Site	Weight
Rell Photographs: (Yes) No Frame No(s).	t2 Collection Method
Age of Fish Spine, Scale, Ra	ay Preserved: Yes No
	reroded of for ulcerations

Species	Fish No (s). <u>K40543</u>
Collection Date	Length
Collection Site	Weight
Photographs: Ves No Frame No(s). <u>16</u>	Collection Method
Age of Fish Spine, Scale, Ray	Preserved: Yes No
Ulcaritims L chell L side posterior to anus	

-	Species	Fish No (s). <u>K 40553</u>
1.	Collection Date	Length
1 	Collection Site	Weight
1	Photographs: (Yes) No Frame No(s). 3	Collection Method
į	Age of Fish Spine, Scale, Ray	Preserved: Yes No
	Pap Homas	

Species	Fish No (s). 1440555
Collection Date	Length
Collection Site	Weight
	Collection Method
Age of Fish Spine, Scale, Ra	ay Preserved: Yes No

Species	Fish No (s). 14.413571
Collection Date	Length
Collection Site	Weight
Photographs: Yes No Frame No(s). 20	Collection Method
Age of Fish Spine, Scale, Ray	



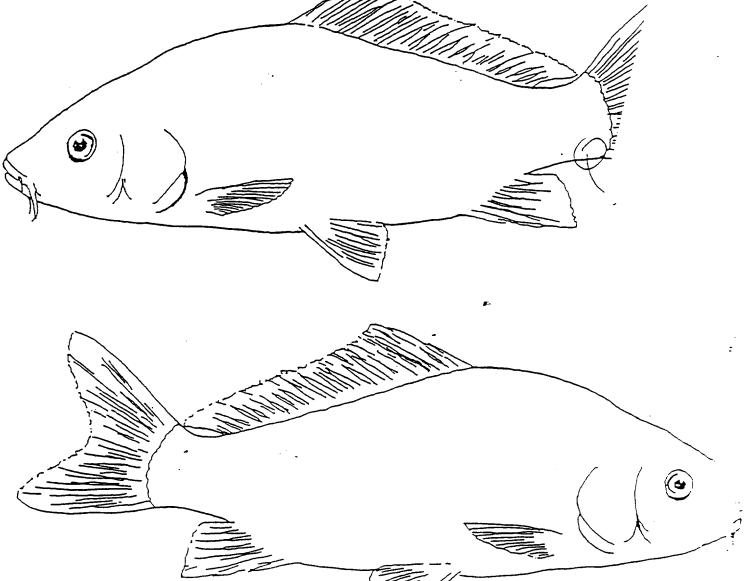
Species	Fish No (s). 1442572
Collection Date	Length
Collection Site	Weight
Ro11 #3	Collection Method
Photographs: Yes No Frame No(s).	. <u>11</u> Description
Age of Fish Spine, Scale, Ra	ay Preserved: Yes No
	133
Contusions	on Stomach prob from like well
	Gob tam live (2)

Species	Fish No (s). 1< 40573
Collection Date	Length
Collection Site	Weight
Ril ±3	Collection Method
	32 Description
Age of Fish Spine, Scale, Ra	y Preserved: Yes No
	Contisions on stomach production live well
	Marie Marie

Species	Fish No (s). <u>K 4357~1</u>
Collection Date	Length
Collection Site	Weight
Photographs: Yes No Frame No(s). <u>23</u> Age of Fish Spine, Scale, Ray	۲
Sim propilaria on interviorial	

Species	Fish No (s). <u>K40592</u>
Collection Date	Length
Collection Site	Weight
\smile	Collection Method
Age of Fish Spine, Scale, Ray	Preserved: Yes No
	Missing R. Fr. = T Barket

CARP FISH CONDITION SURVEY FORM		
Fish No (s). <u>K40640</u>		
Length		
Weight		
Collection Method		
Description		
Preserved: Yes No		



Attachment A-4

Pass Fish Condition Survey Form

BLASLAND, BOUCK & LEE, INC.

engineers & scientists

Species Adult 5m Bass	Fish No (s). 1540500
Collection Date	Length
Collection Site	Weight
	Collection Method
Photographs: Yes No Frame No(s). A	<u>দি/</u> Description <u>ନିଧ୍ୟ</u>
Age of Fish Spine, Scale, Ray	Preserved: Yes No
MMMM.	
	Maceration Constitution of the Constitution of

	Species	Fish No (s). <u>K40590</u>
	Collection Date	Length
(Collection Site	Weight
	Roll Z	Collection Method
	Photographs: Yes No Frame No(s). 13	Description
	Age of Fish Spine, Scale, Ray	Preserved: Yes No
	abv. L. mex/b-y	

Species	Fish No (s). <u>140542</u>
Collection Date	Length
Collection Site	Weight
Rd1#2	Collection Method
Photographs: Yes No Frame No(s). 15	Description
Age of Fish Spine, Scale, Ray	Preserved: Yes No
MAMMAN	
Thur William Control	The Millians
	<i>~~</i>
	. x x M x
The second secon	KKKKKW
Sher Sher	
	1-//ml
	Healed wound
 - "//, /	\/ //

Species	Fish No (s). <u>£40545</u>
Collection Date	Length
Collection Site	Weight
Roll #2	Collection Method
Photographs: Yes No Frame No(s). 18	
Age of Fish Spine, Scale, Ray	Preserved: Yes No
hook scars on L. mandible	

Spec	ies	Fish No (s). <u>K40859</u>
Colle	ection Date	Length '
Colle	ction Site	Weight
Photo	ographs: (es) No Frame No(s). 8	Collection Method
Age	of Fish Spine, Scale, Ray	Preserved: Yes No
Socie of Max		

Species	Fish No (s). 140565-6
Collection Date	Length
Collection Site	Weight
- Rul #3	Collection Method
Photographs: (es) No Frame No(s). 13	Description
Age of Fish Spine, Scale, Ray	Preserved: Yes No
MMMM.	
	TVASCAS CARACTER STATE OF THE S

ATTACHMENT A-4 BASS FISH CONDITION SURVEY FORM

	Species	Fish No (s). <u>440575</u>
	Collection Date	Length
-	Collection Site	Weight
]	$f_{ol} = 3$ Photographs: Yes No Frame No(s). 24	Collection Method
į	Age of Fish Spine, Scale, Ray	
	James and Market	

-	Species	Fish No (s). K43576
•	Collection Date	Length
-	Collection Site	Weight
	© 11 ± 3	Collection Method
-	Photographs: (Yes) No Frame No(s). 25	Description
••	Age of Fish Spine, Scale, Ray	Preserved: Yes No
	MMMM.	
	Contusions Loim R 5 Sin papilis O O O O O O O O O O O O O	the in vicinity of And fin

Ī	Species	Fish No (s). 164.0577
·1	Collection Date	Length
1	Collection Site	Weight
	Photographs: \overrightarrow{Y} es No Frame No(s). $3 = 3$	Collection Method
J	Age of Fish Spine, Scale, Ray	Preserved: Yes No
	MMMM.	
		Machinal & Procession

BASS FISH CONDITION SURVEY FORM

40	Species	Fish No (s). <u>K 40628</u>
	Collection Date	Length
	Collection Site	Weight
	R>11±5	Collection Method
	Photographs: Yes No Frame No(s). //	Description
	Age of Fish Spine, Scale, Ray	Preserved:_ Yes No
	MAMMA	
-		MISSING & PAR

The state of the s

Appendix B Photographic Log

BLASLAND, BOUCK & LEE, INC.

engineers & sclentists

ABSA #1

CARP	ADULT
	SMALLMOUTH BASS
K40640	K40623
K40641	K40624
K40643	K40625
K40644	K40626
K40645	K40627
K40646	K40628
K40647	K40635
K40648	K40636
K40649	K40637
K40650	K40638
K40651	K40639

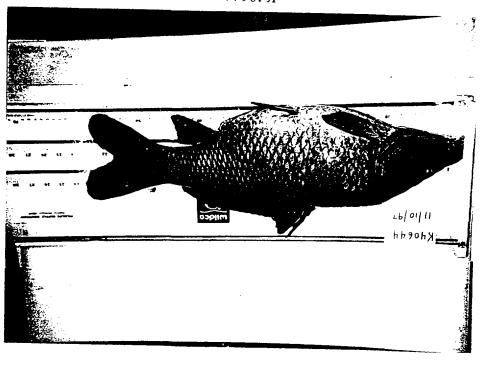
Carp (*Cyprinus carpio*)



K40640



K40641

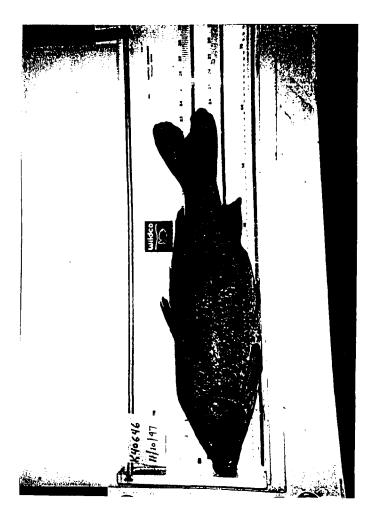


K40643

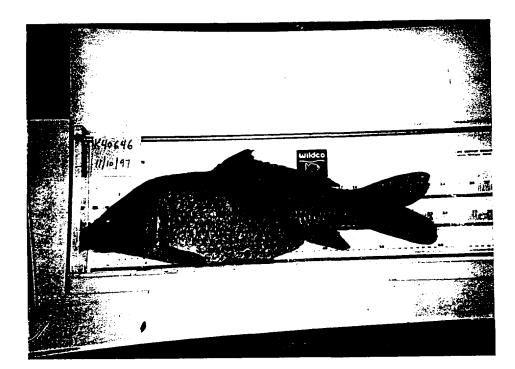
K40644



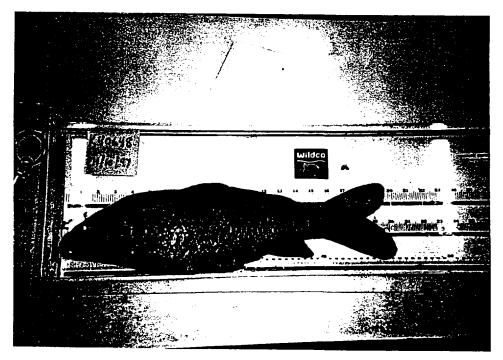
K40645



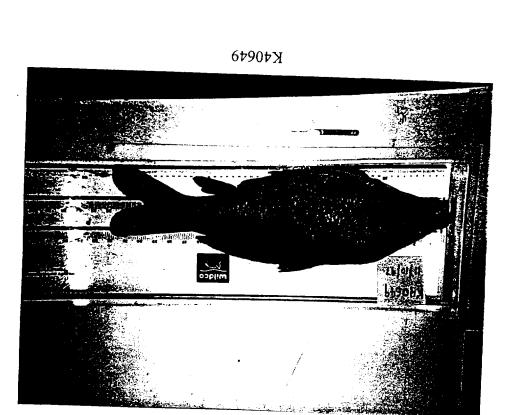
K40646

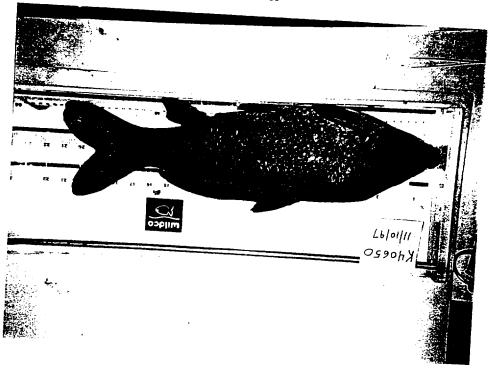


K40647

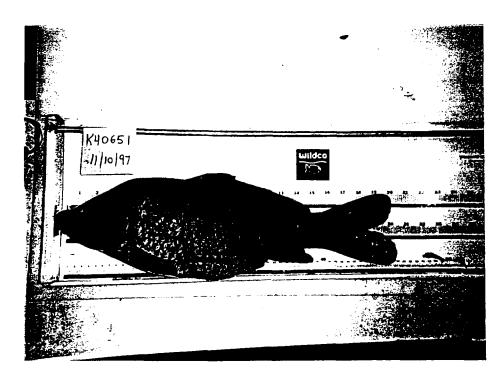


K40648





K40650

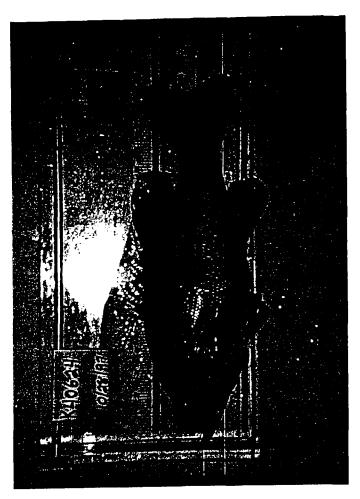


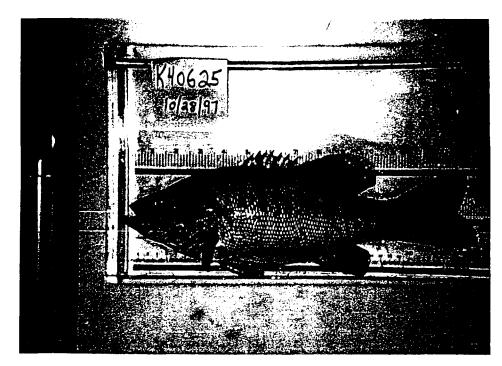
K40651



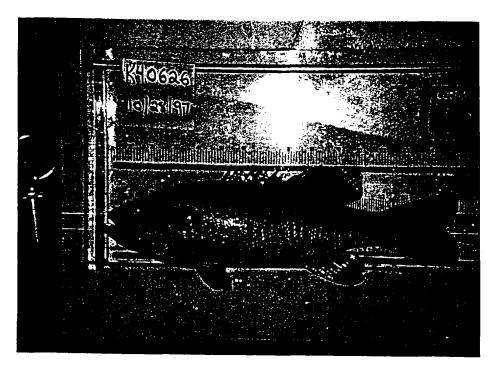


K40623

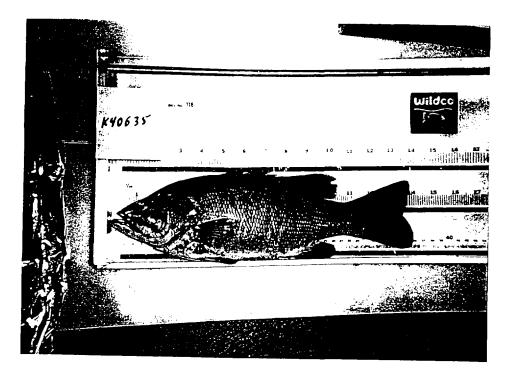




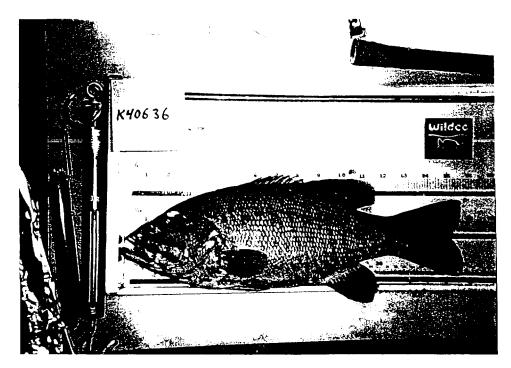
K40625



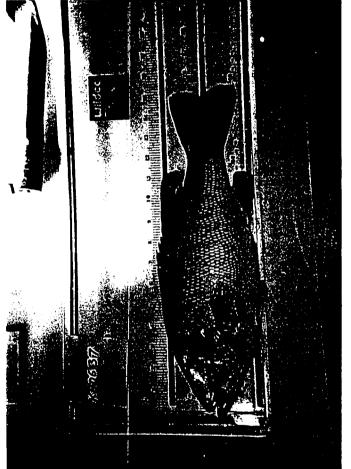
K40626



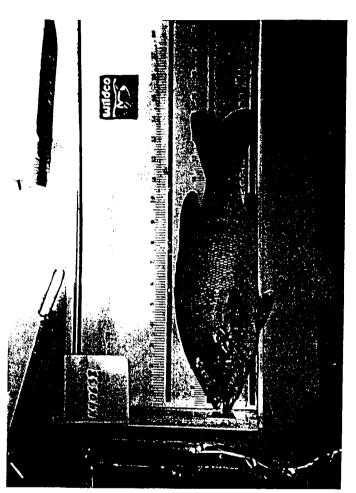
K40635



K40636

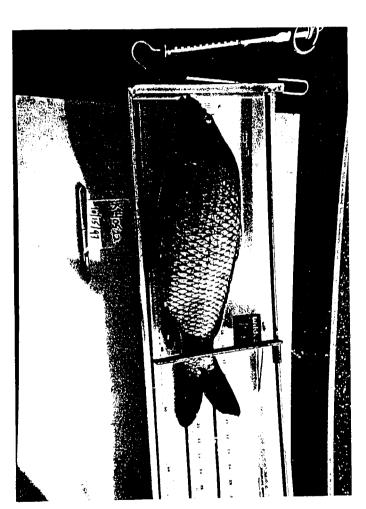


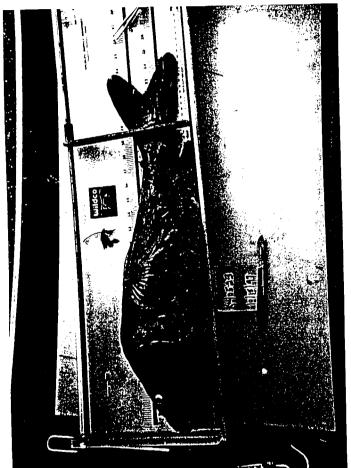
K40637



K40638





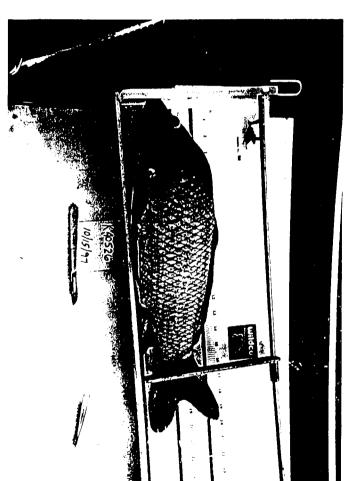


K40523

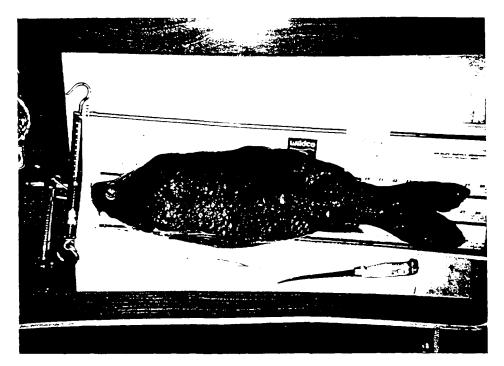


K40523

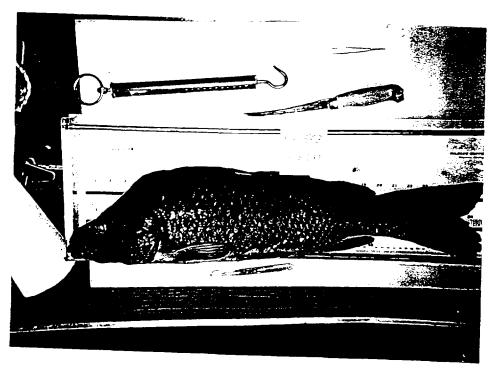




K40526

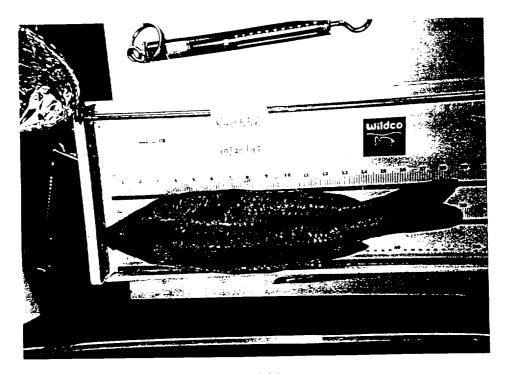


K40552

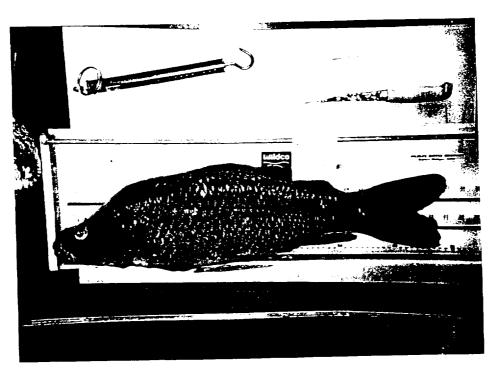


K40553

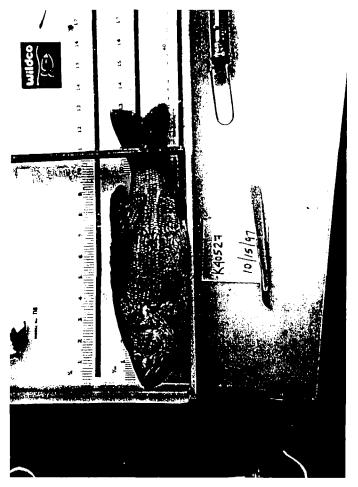
Adult Smallmouth Bass (Micropterus dolomieui)



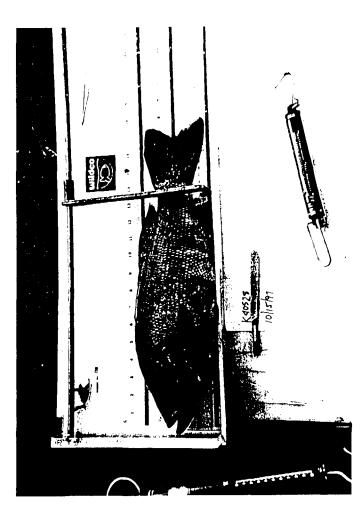
K40556



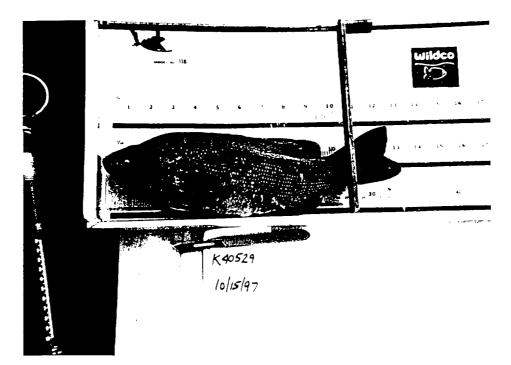
K40557



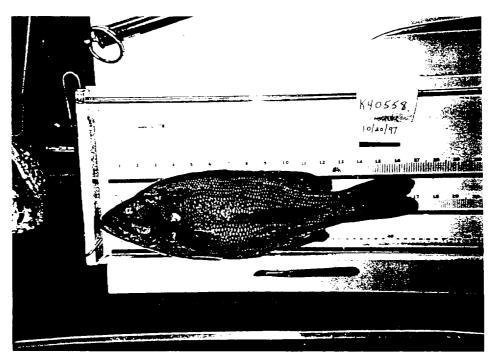
K40527



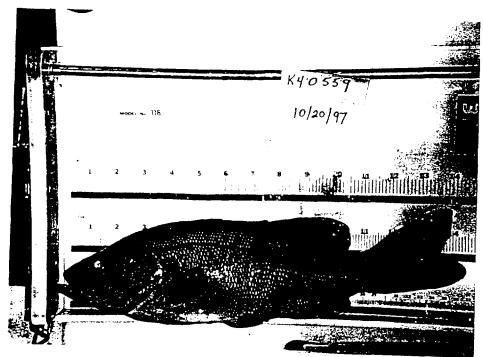
K40528



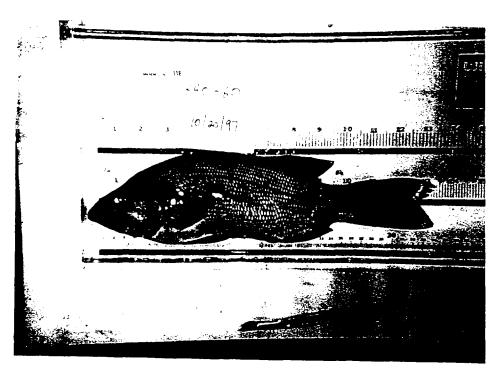
K40529



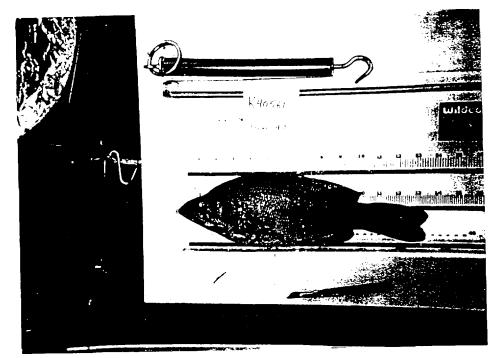
K40558



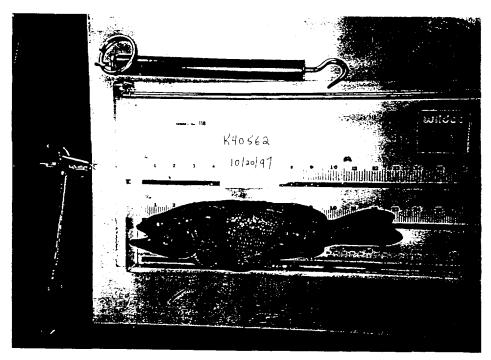
K40559



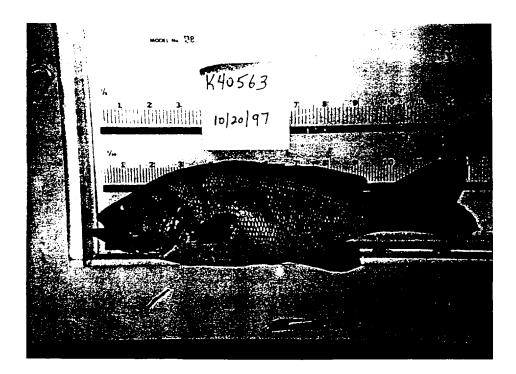
K40560



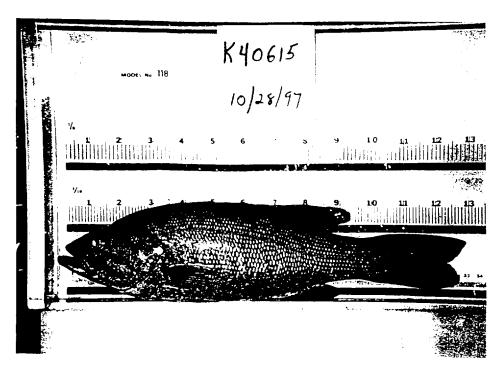
K40561



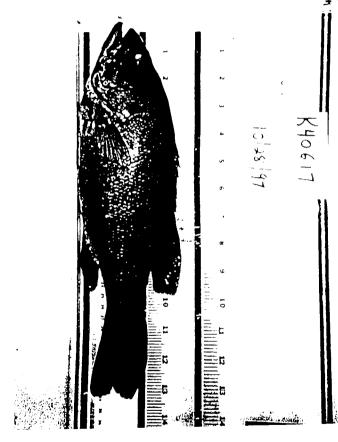
K40562



K40563



K40615

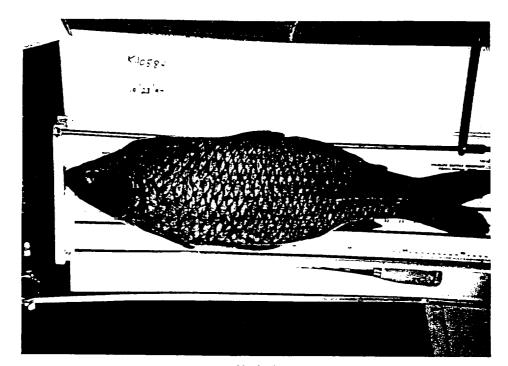


K40617

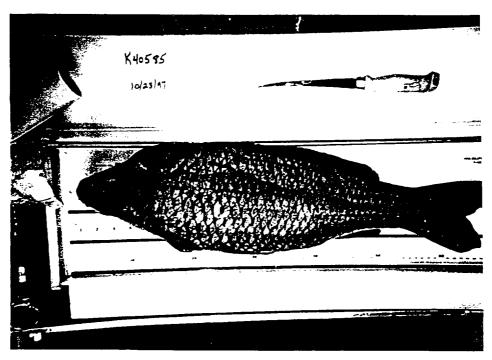
ABSA #5

CARP	ADULT
	SMALLMOUTH BASS
K40584	K40596
K40585	K40597
K40586	K40598
K40587	K40599
K40588	K40600
K40589	K40601
K40591	K40602
K40592	K40603
K40593	K40605
K40594	K40606
K40595	K40607

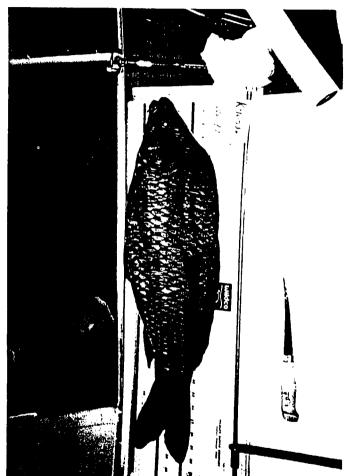
Carp (Cyprinus carpio)



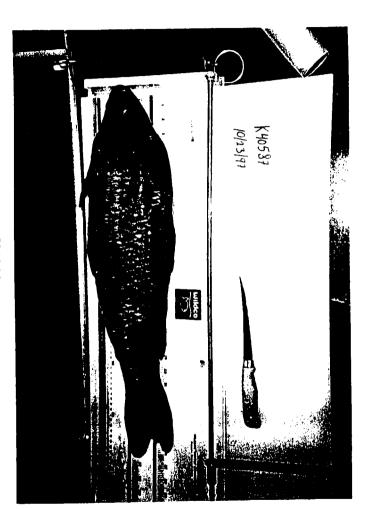
K40584



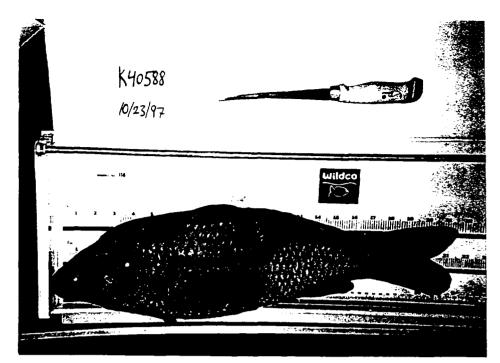
K40585



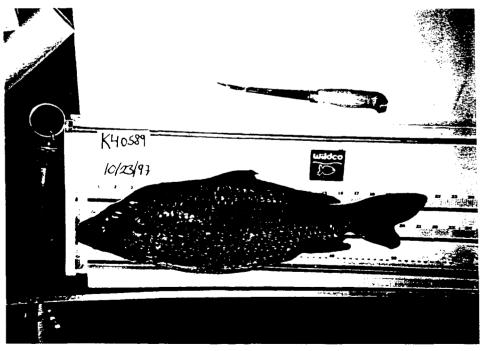
K40586



K40587

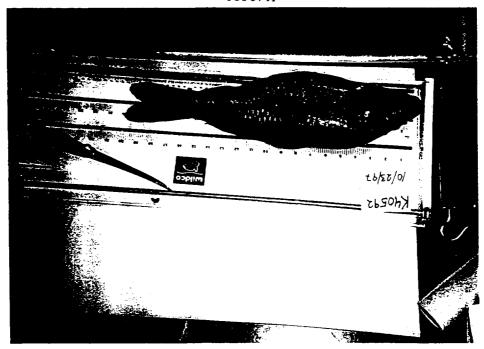


K40588

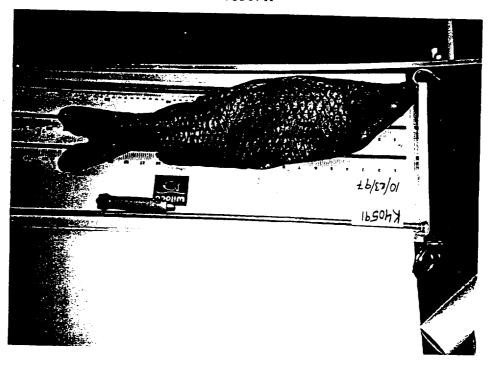


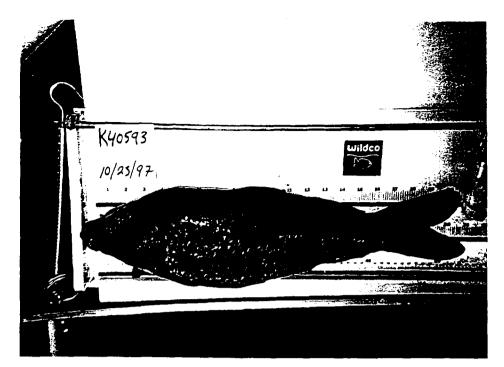
K40589

Kt0265

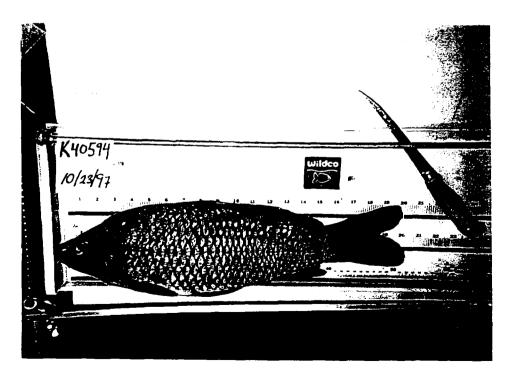


K40231

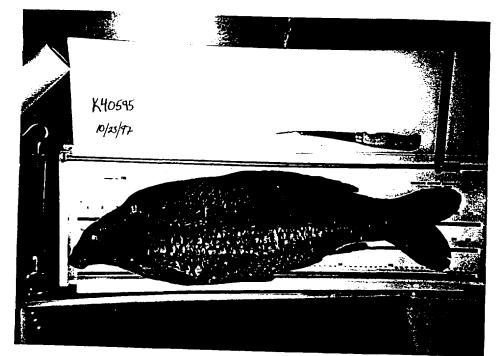




K40593



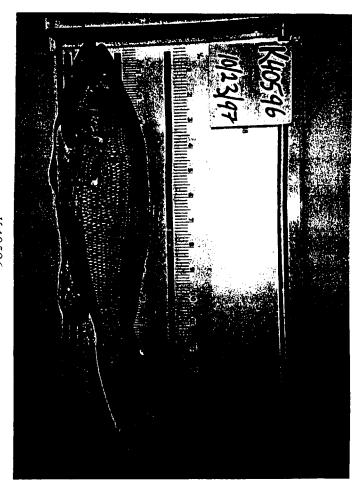
K40594



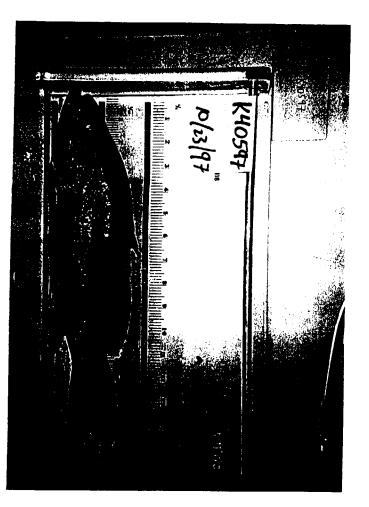
K40595

Adult Smallmouth Bass (Micropterus dolomieui)

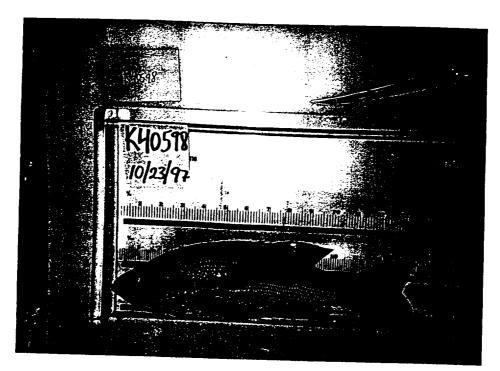




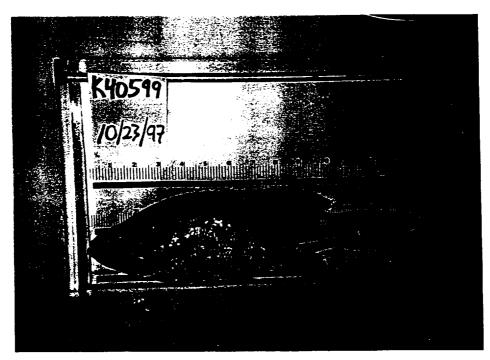
K40596



K40597

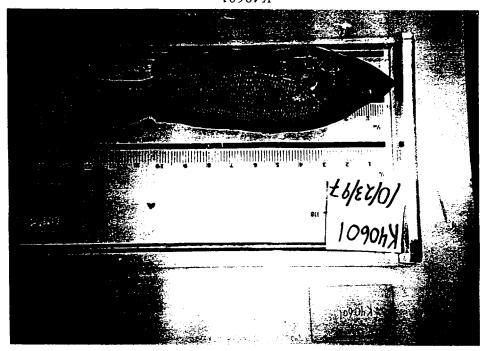


K40598

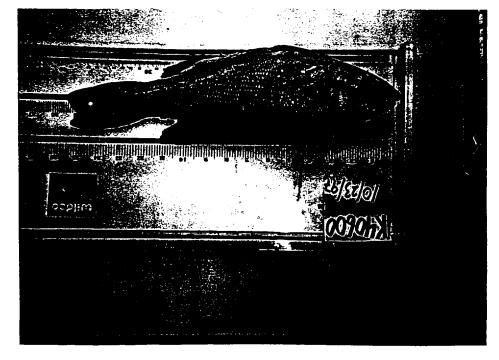


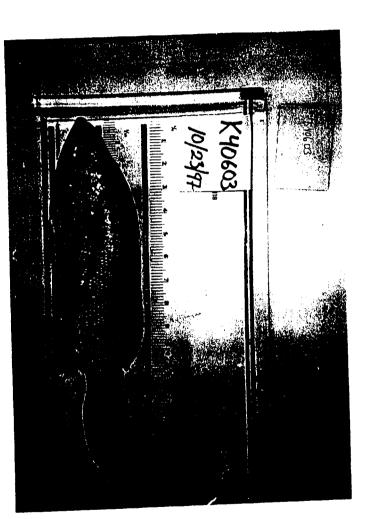
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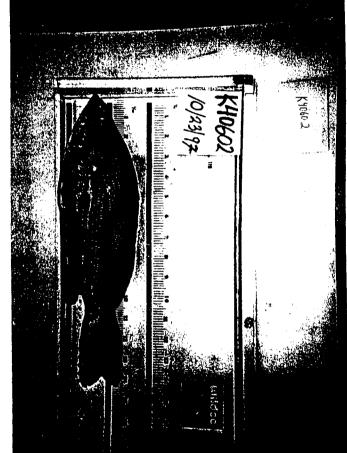
K40901



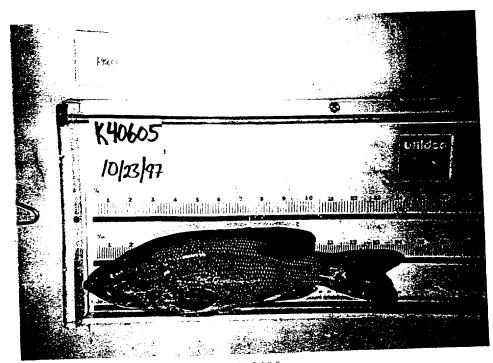
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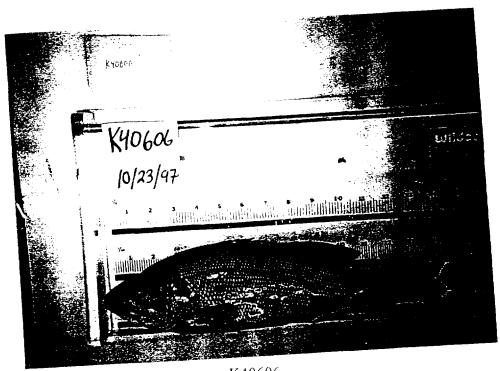




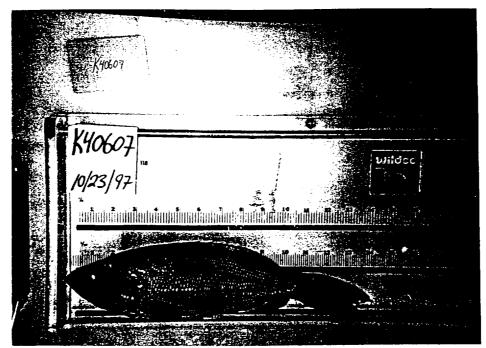
K40602



K40605



K40606

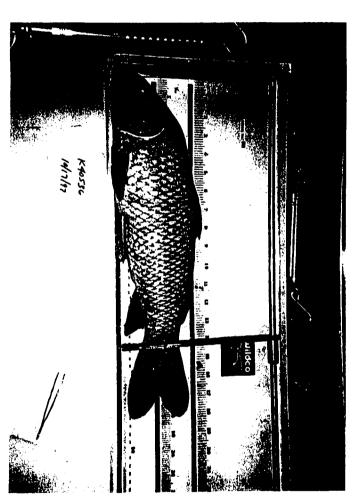


K40607

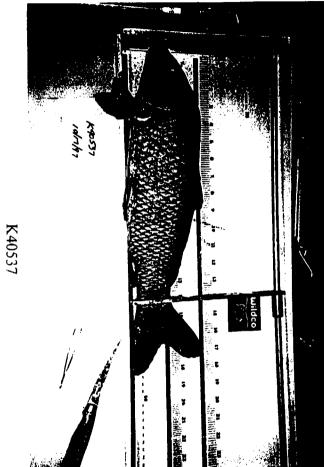
ABSA #9

CARP	ADULT SMALLMOUTH BASS
K40535	K40540
K40536	K40542
K40537	K40575
K40538	K40576
K40539	K40577
K40568	K40578
K40569	K40579
K40570	K40580
K40571	K40581
K40572	K40582
K40574	K40583

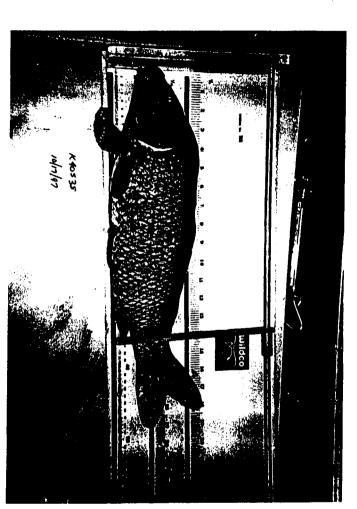
Carp (Cyprinus carpio)



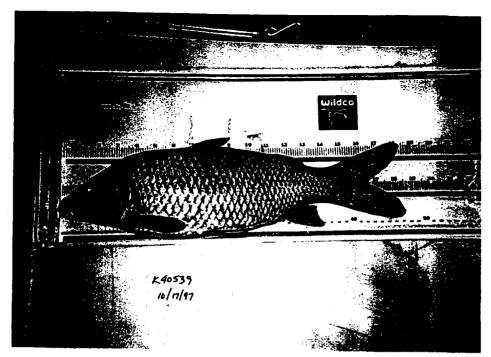
K40535



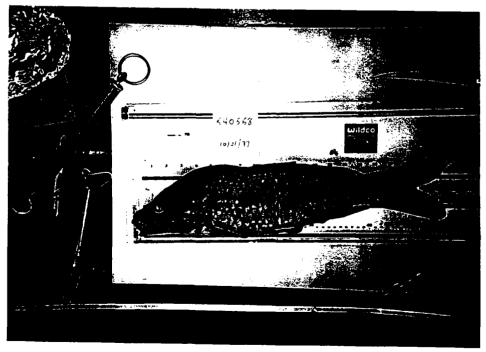




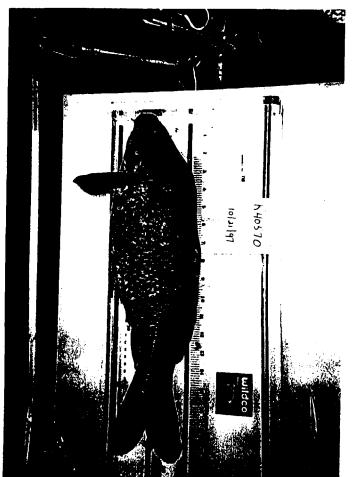
K40538



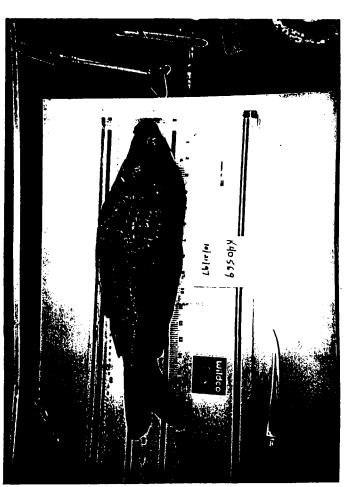
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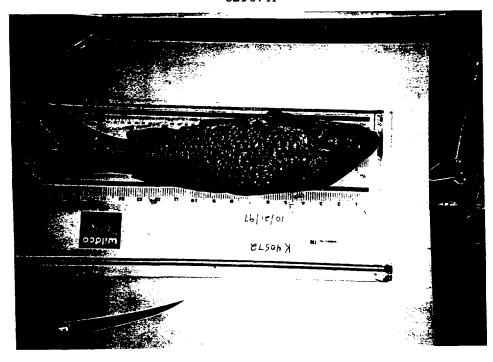
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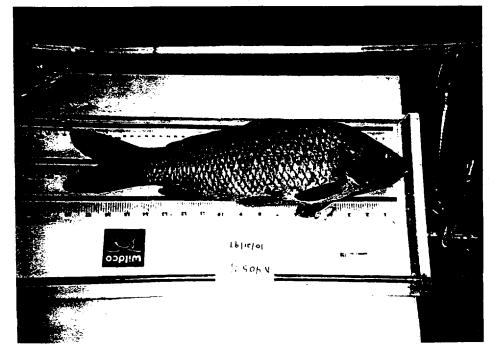
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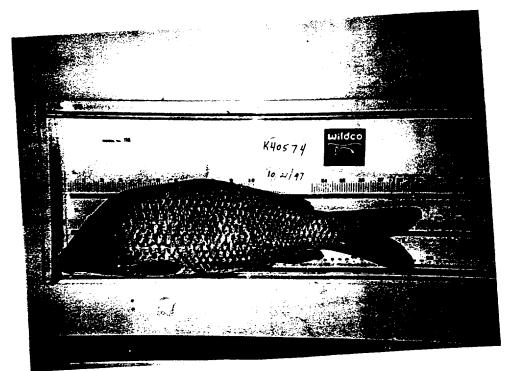


K40570



K40211

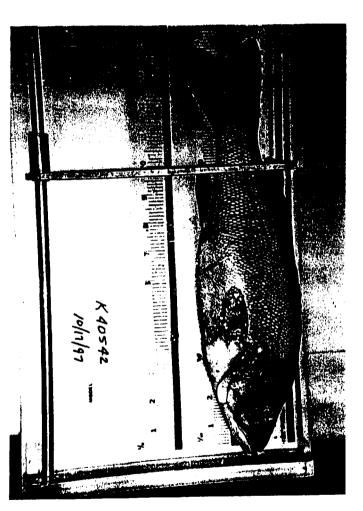




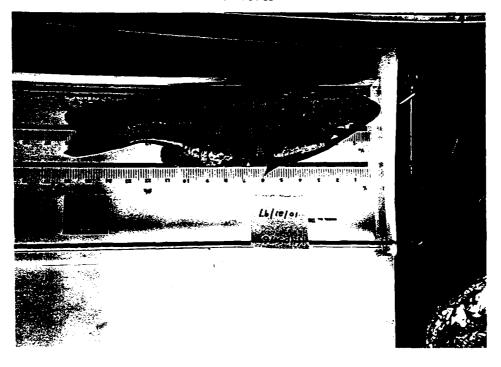
K40574

Adult Smallmouth Bass (Micropterus dolomieui)

K40540

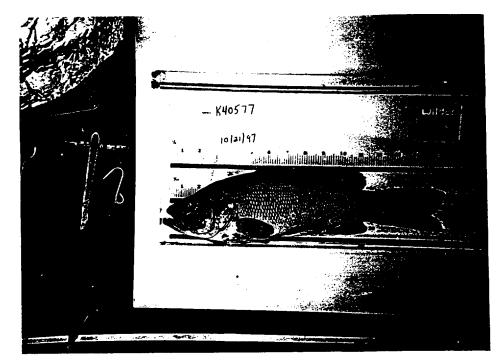


K40542

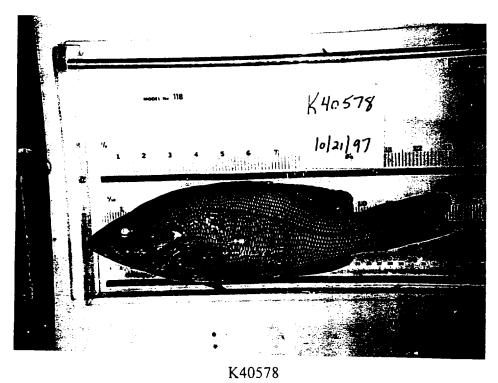


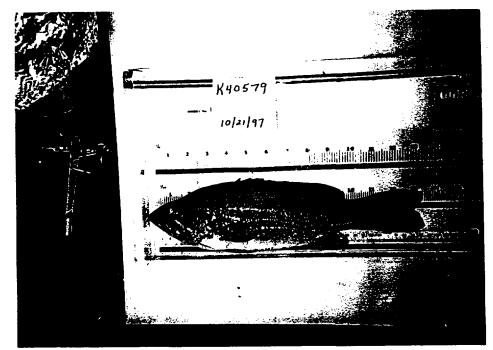
K40212



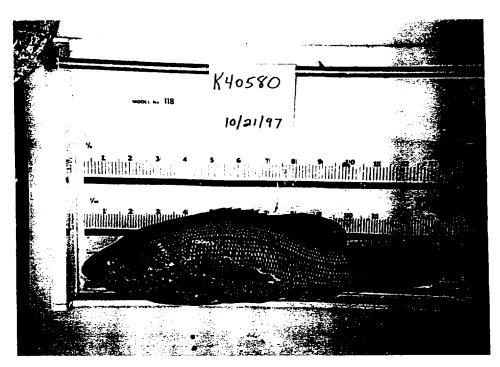


K40577





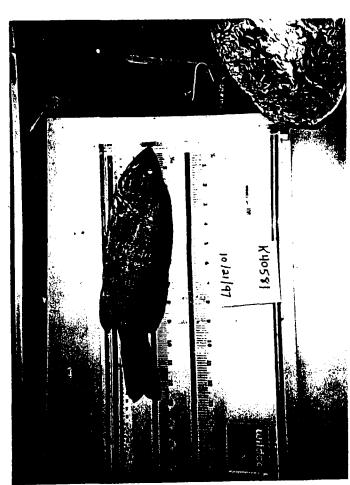
K40579

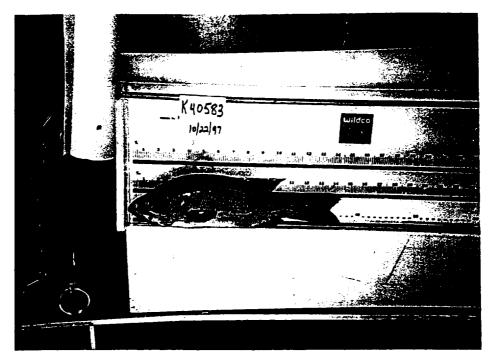


K40580



K40581



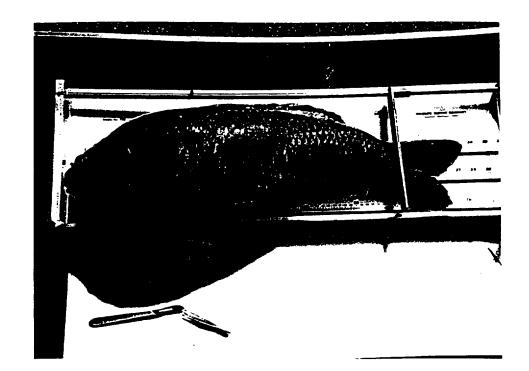


K40583

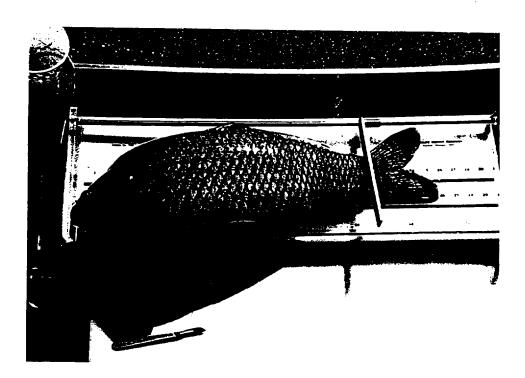
ABSA #11

CARP	ADULT
	SMALLMOUTH BASS
K40505	K40500
K40506	K40502
K40507	K40544
K40508	K40545
K40509	K40546
K40511	K40547
K40512	K40548
K40513	K40549
K40514	K40550
K40515	K40613
K40516	K40614
K40543	

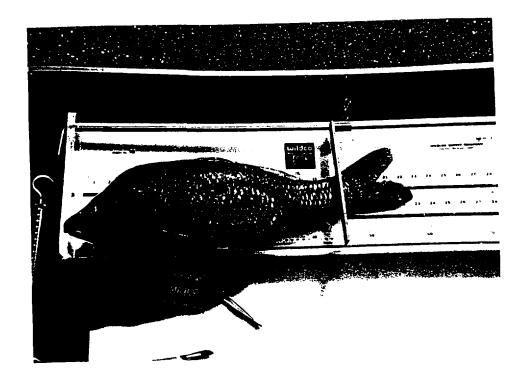
Carp (Cyprinus carpio)



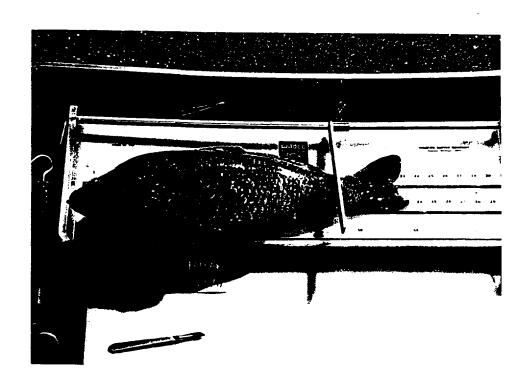
K40505



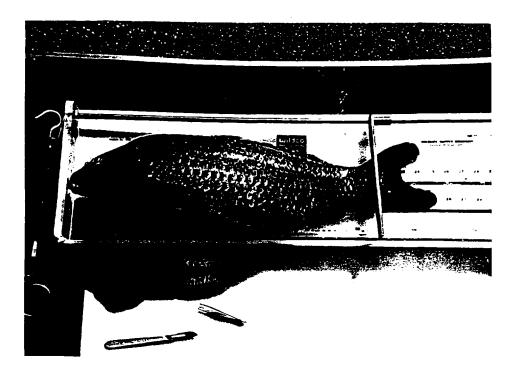
K40506



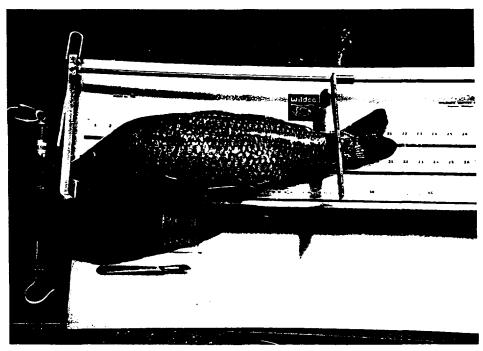
K40507



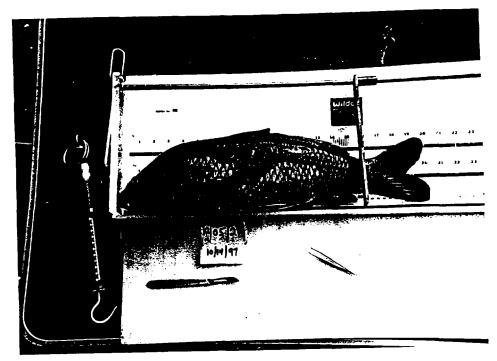
K40508



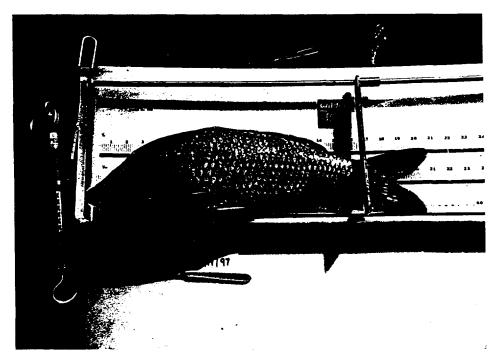
K40509



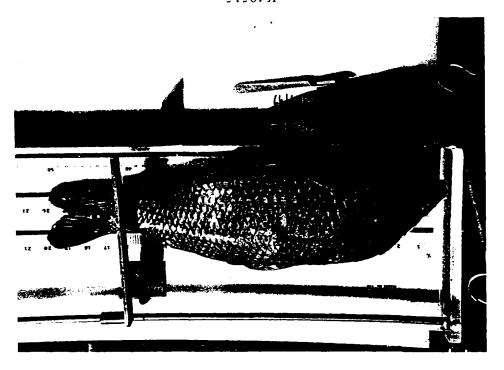
K40511



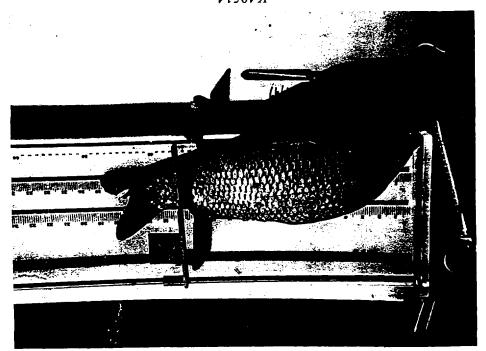
K40512



K40513



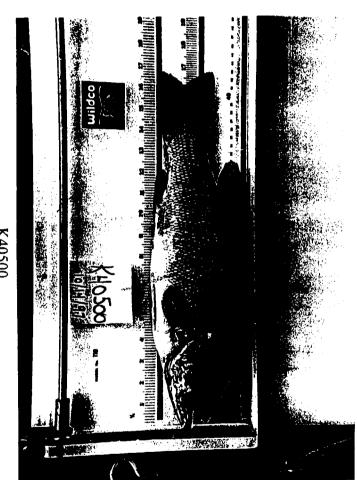
Kt021t



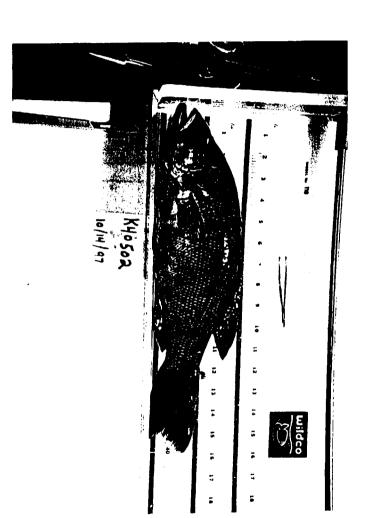


K40516

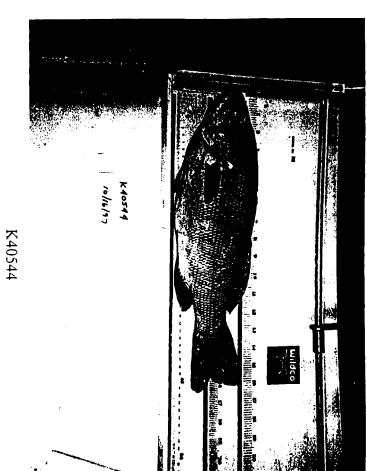
Adult Smallmouth Bass (Micropterus dolomieui)

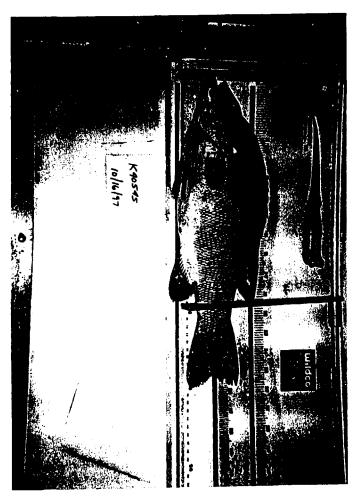


K40500

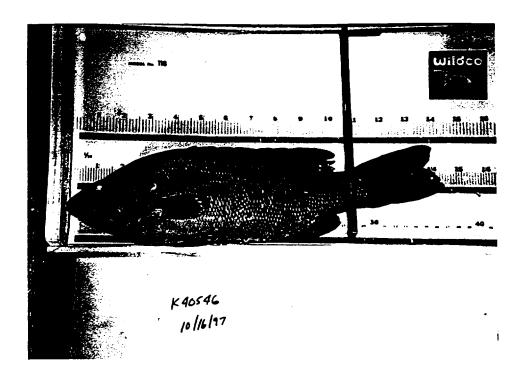


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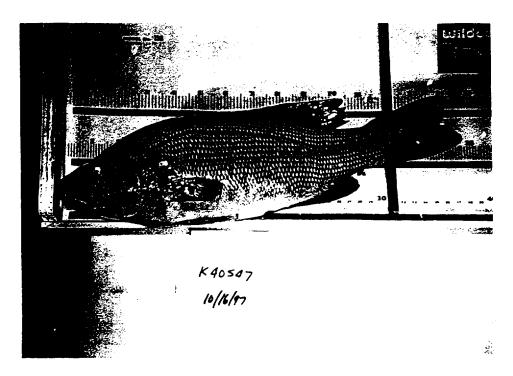




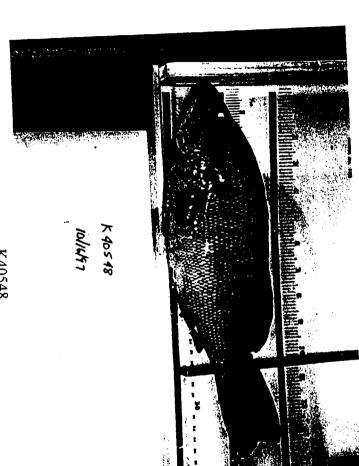
K40545



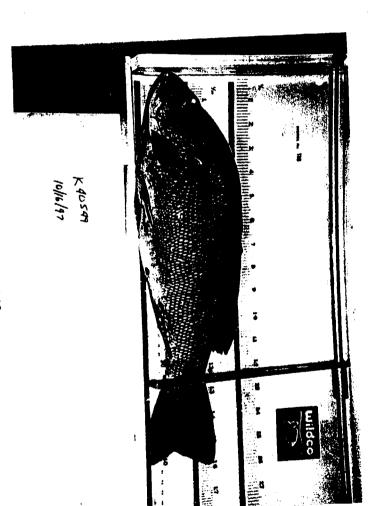
K40546



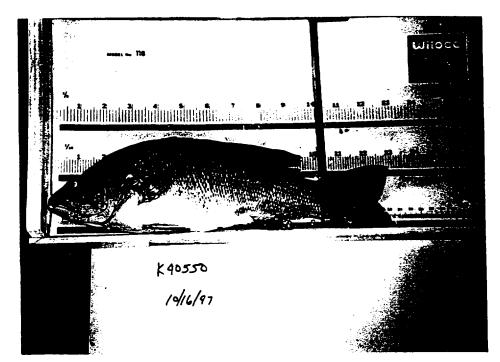
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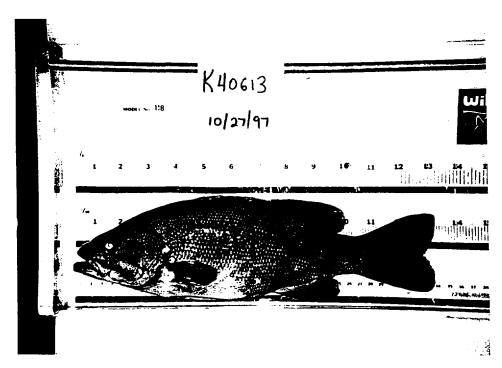
K40548



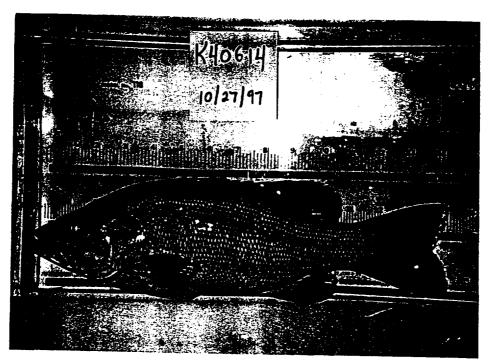
K40549



K40550



K40613



K40614

Appendix C Chain-of-Custody Records

BLASLAND, BOUCK & LEE, INC.
engineers & scientists



CHAIN OF CUSTODY RECORD PAOJ. NO. Koloniz o River Result + Fil NO. SAMPLERS: /Senerum Q.F REMARKS CON-TAINERS STA. NO. DATE TIME STATION LOCATION 40500 lidelin 13:2 New Richmod - AGSAUII K40502 K40503K K4 6501-C1 40512 14 40513 40514 K 40515 Do not run analysis of those samples. Hold hamagenates in Frozen storage until 0 K 40516 additional instructions are received regarding Sample deposition KOS 11/24/97 Date / Time Received by: (Signature) Relinquished by: /Signatural Relinquished by: Islandiure! Date / Time Received by: Isignatural 1915/47 17:4 Date / Time Relinquished by: (Signatura) Received by: (Signature) Received by: Isignatural Date / Time Relinquished by: Isignamiel Date / Time Remarks Date / Time Received for Laboratory by: Relinquished by: (Signature) (Signalura) Distribution: Original Assomaintes Shipment; Copy to Coordinator Field Files

PLASLAND & BOUCK EMGINEERS, P.C.

CHAIN OF CUSTODY RECORD PAOJ. NO. PROJECT NAME SAMPLERS: ISIGNATUREY NO. OF REMARKS CON-TAINERS DATE TIME STA. NO. **STATION LOCATION** 10/14/97/12:00 X Market ABSOAU · K 40506 · K 42507 · 15 40518 · K 4254 * Do not run analysis of those samples. Hold homogenates in Frozen storage until additional instructions are received regarding sample disposition. ISDS 11/24/97 · K 4.511 Date / Time Received by: (Signature) Date / Time Received by: (Signature) Relinquished by: Isignatural Relinquished by: (Signature) 10/15/17 16:110 Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Remarks Date / Time Received for Laboratory by: Relinquished by: (Signature) (Signatural

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

BLASLAND & BOUCK SNGINESES, P.C.

CHAIN OF CUSTODY RECORD PROJ. NO. PROJECT NAME 1 month Kalamazuo River Resident Fish GAS24711 NO. SAMPLERS: (Signature) OF REMARKS CON-TAINERS. TIME STA. NO. DATE **STATION LOCATION** MURROW POND - ABOA # 2 yee whole body companies K10517-C1015 KAUSIR-6 1915 HU519-6 1415 K 10520-C 10/15 any ze following may ken! K40521 Morry Pal discussed president K40522 COND(450 will file by) Sor Bose (Sking on K40523 K40514 No not run analysis of there fish. Hold harmone notes K4U525 in Frazen storbue until aiblitional instructions lave K40526 Murrow Cal ABOA = 2 Sm riss KOS 11/24/97 received regarding sample disposition. X40527 K40528 K40529 Date / Time Received by: Isignature) Relinquished by: (Signatura) Received by: (Signatural Date / Time Relinquished by: Isignature! 10/17/97 16:50 Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquisted by: 15 monres Date / Time Remarks Date / Time Received for Laboratory by: Relinquished by: /Signature/ (Signatural Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files



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42534-61	n	11				11	· · · · · · · · · · · · · · · · · · ·				I				*	40'	234 Y	,,,,	hine with	40234	C-2 1.1	Aun I	11.11 1
40535	विग ५७)O; @>		X	Lelle A'le;	الارت ب	N # (1 4)	ell Coop	1		λ	X			F	illet	creb	(Sku	-d 1:11	م (داء	nd press	(skin-	20 C/A
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K40538									1										i				_
1445539	-					1			(1)	Y.								· · · · · · · · · · · · · · · · · · ·					
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K40241					j				3)	116					×	*	ام ممداء	الاند ملا –	lyso sampl	os Hola	homoceni	tos in tro	zenkt
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nquisi	hed by: (S	Signature)		DATE	TIME	Received for Laboratory by: (Signature)			DATE		Ti	ME	Remark	(8:	
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CHAIN OF CUSTODY RECORD

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STA. NO.	DATE	TIME	COMP	GRAB GRAB	Thomas	STATI	ION LOCATION		A SA	3 / 01/	10 A	<i>X</i> /		//			REMARKS
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K40569	<u> </u>						,							Ana	Intreal	Prix	fillels) and analyze Colling
K40570															7	1	7 7
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CHAIN OF CUSTODY RECORD

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BLASLAND & BOUCK ENGINEERS, P.C.

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Appendix D QA/QC Review of Data Summary of Precision and Accuracy Assessment

Appendix D

QA/QC Review of Data - Summary of Precision and Accuracy Assessment Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site

Data packages for eight sample delivery groups (SDGs), designated FISH01, FISH02, FISH03, FISH04, FISH05, FISH06, FISH07 and FISH08, containing biota sample data for PCBs were reviewed and evaluated for analytical precision and accuracy. It should be noted that some SDGs included whole-body composite samples. Since the SDGs were analyzed and reported as a group, the QA/QC review of the results also addressed the entire SDG. Therefore, although not presented in the Technical Memorandum Addendum, the whole-body composite sample results are included in the following summary, as well as the laboratory data sheets provided in Appendix E of this document.

Analytical precision for biota samples was assessed by comparing the relative percent differences (RPDs) between percent recoveries for the matrix spike (MS) and matrix spike duplicate (MSD) samples.

Matrix spike recovery and other indicators of accuracy, such as surrogate spike and laboratory control sample (LCS) recoveries, were examined to assess the analytical method's accuracy for all matrixes.

An overall precision and accuracy summary, as assessed through the review of QA/QC information including MS and MSD recoveries, RPD values for MS/MSD recoveries, surrogate spike recoveries, laboratory control sample (LCS) recoveries and blank performance, is present below. A more detailed analysis of data quality can be found in the Laboratory Data Review Reports (Appendix E).

1. Data Quality Assessment for Bass Analyses

Seven data packages containing bass samples were reviewed and inspected for analytical precision and accuracy.

Bass Fillet PCB Data Quality Summary

Bass fillet data from the 1997 sampling event showed no pervasive bias as demonstrated by surrogate, LCS and MS recoveries. Surrogate recoveries of the samples, MS/MSDs, LCSs and method blanks were consistent, indicative of minimal matrix effect on data accuracy. All LCS and matrix spike recoveries were within control limits. With two exceptions, all surrogate recoveries were also within control limits.

- MS/MSD recoveries for Aroclor 1242 ranged from 109 to 123 percent with an average of 116 percent while recoveries for Aroclor 1254 ranged from 107 to 120 percent with an average of 114 percent. RPD values ranged from 11 to 12 with an average of 12 percent.
- LCS recoveries were within acceptable limits with recoveries for Aroclor 1242 ranging from 97 to 172 percent with an average of 120 percent and recoveries for Aroclor 1254 ranging from 91 to 142 percent with an average of 115 percent.
- Surrogate recoveries were within control limits for all but two samples. Tetrachloro-meta-xylene (TCX) recoveries ranged from 57 to 152 percent with an average of 84 percent and decachlorobiphenyl recoveries ranged from 55 to 150 percent with an average of 87 percent. Recoveries for both surrogates were slightly below control limits in sample K40617, indicating a potential low bias to the

sample data. Recoveries for both surrogates were above control limits in sample K40544. All positives data for this sample should be considered potentially biased high based on he recoveries.

- No Aroclors were detected in the method blanks.
- All initial calibration and continuing calibration standards were within method-specified limits.

1.2 Bass Whole Body PCB Data Quality Summary

Bass whole body data from the 1997 sampling event show no pervasive bias as demonstrated by surrogate and LCS recoveries. Surrogate recoveries of the samples, LCSs and method blanks were consistent, indicative of minimal matrix effect on data accuracy. All LCS recoveries were within control limits. With four exceptions, all surrogate recoveries were also within control limits.

- No whole body MS/MSD was analyzed with the samples.
- All LCS recoveries were within acceptable limits, with recoveries for Aroclor 1242 ranging from 97 to 145 percent with an average of 116 percent and recoveries for Aroclor 1254 ranging from 91 to 143 percent with an average of 112 percent.
- Surrogate recoveries were within control limits for all but four samples. Tetrachloro-meta-xylene (TCX) recoveries ranged from 19 to 127 percent with an average of 73 percent and decachlorobiphenyl recoveries ranged from 25 to 133 percent with an average of 88 percent. Recoveries for bot surrogates were below control limits in sample K40612, indicating a low bias to the sample data.—Recovery for one surrogate was below control limits in samples K40565, K40566 and K40567. Since recoveries for the remaining surrogate were within control limits, the deviations should have little or no impact on the sample data.
- No Aroclors were detected in the method blanks.
- All initial calibration and continuing calibration standards were within method-specified limits.

2. Data Quality Assessment for Carp PCB Analyses

Six carp data packages from the 1997 sampling event were reviewed and inspected for analytical precision and accuracy.

2.1 Carp PCB Data Quality Summary

Carp data from the 1997 sampling event showed no pervasive bias as demonstrated by surrogate, MS and LCS recoveries. Surrogate recoveries of the samples, MS, LCSs and method blanks were consistent, indicative of minimal matrix effect on data accuracy. All LCS and matrix spike recoveries were within control limits. With eight exceptions, all surrogate recoveries were also within control limits.

MS/MSD recoveries for Aroclor 1242 ranged from 108 to 182 percent with an average of 145 percent while recoveries for Aroclor 1254 ranged from 114 to 192 percent with an average of 153 percent.
 RPD values were 51 percent.

- LCS recoveries were within acceptable limits with recoveries for Aroclor 1242 ranging from 97 to 172 percent with an average of 123 percent and recoveries for Aroclor 1254 ranging from 91 to 143 percent with an average of 118 percent.
- Surrogate recoveries were within control limits for all but eight samples. Tetrachloro-meta-xylene (TCX) recoveries ranged from 37 to 135 percent with a mean value of 76 percent and decachlorobiphenyl recoveries ranged from 70 to 144 percent with a mean value of 95 percent. Recoveries for one surrogate was below control limits in samples K40506, K40512, K50415, K40587, K40640, K40641, K40643 and K40645. Since recoveries for the remaining surrogate were within control limits, the deviations should have little or no impact on the sample data.
- No Aroclors were detected in the method blanks.
- All initial calibration and continuing calibration standards were within method-specified limits.

Appendix E Data Quality Review Reports

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# FISH01

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH01 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

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Sample ID			Sampling Date	VOA	BNA	PCB	TAL	%LIPID		
K40500	345205	tissue	10/14/97			x		х		
K40502	345207	tissue	10/14/97			x		x		
K40503C	345208	tissue	10/14/97			x		×		
K40506	345209	tissue	10/14/97			×		x		
K40507	345210	tissue	10/14/97			x		x		
K40508K	345211	tissue	10/14/97			х		×		
K40509	345212	tissue	10/14/97			x		×		
K40511	345214	tissue	tissue	tissue	10/14/97			x		x
K40512	345215	tissue	10/14/97	7	х	x	×			
K40513	345216	tissue	10/14/97			×		x		
K40514	345217	tissue	10/14/97			x		x		
K40515	345218	tissue	10/14/97			×		x		
K40516	345219	tissue	10/14/97			×		×		
K40504-C1	345418	tissue	10/14/97			_ х		x		
K40504-C2	345419	tissue	10/16/97			×		x		
K40504-C	345420	tissue	10/14/97			×		x		
K40517-C	345421	tissue	10/15/97			х		х		
K40518-C	345422	tissue	10/15/97			×		×		
K40519-C	345423	tissue	10/15/97	<i>g</i> .		x		x		
K40520-C	345424	tissue	10/15/97			×		х		
			 	1		1	1			

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed beyond the specified holding time. Based on the deviation, all data has been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for one surrogate was below control limits in samples K40506, K40512 and K40515. Since recoveries for the remaining surrogate were within control limits, no data has been qualified based on the deviations. Recovery for both surrogates were above control limits in the extraction blank. Since surrogate recoveries for all samples associated with the blank were acceptable, no action has been taken based on the deviation. Surrogates were diluted beyond the range of detection in sample K40509. No data has been qualified based on diluted surrogates.

All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Ofther than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	<u> </u>
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	<u> </u>		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?	<u> x</u>		
Surrogate Recovery			
Are surrogate recovery forms present?	<u> </u>	·	
Are all the samples listed on the appropriate surrogate recovery form?	x		
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	x		
If yes, were the samples reanalyzed?		<u> </u>	
Matrix Spikes			
Is there a matrix spike recovery form present?		X	
Were matrix spikes analyzed at the required frequency?		X	
How many spike recoveries were outside of QC limits?			
NA out of NA			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
NA out of NA			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?			X

PCB Data Review Checklist - Page 2

	YES	NO	NA
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u> </u>		
Arocior 1221	<u> x</u>		
Aroclor 1232	X		
Aroclor 1242	<u> </u>		
Aroclor 1248	<u> </u>		
Aroclor 1254	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	x		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	x		
Are %D values for all compounds within limits (less than 15%)?	x		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	x		
Do the combined column and individual column Aroclor identifications agree?	X	·	
Were there any false negatives?		X	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limits	<u>s</u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?			X

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surre	gates
		TCX	DCB
K40500	+5	·	
K40502	+5		
K40503C	+5	· · · · · · · · · · · · · · · · · · ·	
K40506	+5	1	
K40507	+5		
K40508K	+5		
K40509	+5	D	D
K40511	+5		
K40512	+5	1	
K40513	+5		
K40514	+5		
K40515	+5	ı	
K40516	+5		
K40504-C1	+5	·	
K40504-C2	+5		
K40504-C	+5		
K40517-C	+10		
K40518-C	+10		
K40519-C	+10		
K40520-C	+10		
		6 -	

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

Surrogates diluted out Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	1/28/98-	1/30/98	1/30/98	1/31	1/31	1/31	1/31	1/31
Time:	1/29/98	2118	2145	2156	0337	0902	0929	1307
•	Initial Cal.	Cont. Cal.						
	%RSD	%D						
Aroclor 1016	ok							<u> </u>
Arocior 1221	ok							
Arocior 1232	ok_	_ :						<u> </u>
Arocior 1242	ok		ok					
Aroclor 1248	ok	ok		ok		ok		ok
Aroclor 1254	ok				ok			ļ
Aroclor 1260	ok						ok	<u> </u>
Tetrachioro-m-xylene	ok							
Decachlorobiphenyl	ok		•					
Affected Samples:]				-			
					<i>6</i> .			
					 		 	+

H

EPA SAMPLE NO.

K40500 ITS Environmental Lab Name: Lab Code: INCHVT 91082 SDG: FISH01 Contract: Case: PC8 BIOTA Phase Type: 345205 Lab Sample ID: Phase Weight: 10.0 **(g)** 10/16/97 Date Received: injection Volume: 1.0 (uL) 12/17/97 Date Extracted: 2.0 **Dilution Factor:** 01/31/98 Date Analyzed: 200 pc ax % Solids: Y (Y/N) Sulfur Clean-up:

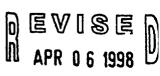
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	N 102
11104-28-2	Aroclor-1221	100	R M
11141-16-5	Aroclor-1232	100	W W
53469-21-9	Aroclor-1242	100	D VO
12672-29-6	Aroclor-1248	330	2
11097-69-1	Aroclor-1254	450	7
11096-82-5	. Aroclor-1260	94	1

						K40502	
Lab Name:	ITS Environmental		Lab Code:	INCHVT			J
Contract:	91082	_	Case:	PC8	SDG:	FISH01	_
Phase Type:	BIOTA	_		Lab Sample ID:	345207	·	
Phase Weight:	10.0	(g)		Date Received:	10/16/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	1.0	_		Date Analyzed:	01/31/98		
% Solids:	1994 jus	-		Sulfur Clean-up:	Y	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	W W
11104-28-2	Aroclor-1221	50	R 102
11141-16-5	Arocior-1232	50	W W
53469-21-9	Aroclor-1242	50	IN CO.
12672-29-6	Aroclor-1248	290	
11097-69-1	Aroclor-1254	330	3
11096-82-5	Aroclor-1260	59	

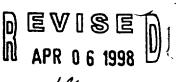
•						K40503C		
ĺ	Lab Name:	ITS Environmental	_	Lab Code:	INCHVT			
7	Contract:	91082	_	Case:	РСВ	SDG:	FISH01	
	Phase Type:	ВІОТА	_		Lab Sample ID:	345208		
	Phase Weight:	10.0	(g)		Date Received:	10/16/97		
	Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
,	Dilution Factor:	2.0	_		Date Analyzed:	01/31/98		
j	% Solids:	JOBLE ANIEN	-		Sulfur Clean-up:	Y	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	I 14 1/2
11104-28-2	Aroclor-1221	100	Z & W
11141-16-5	Aroclor-1232	100	ww
53469-21-9	Arocior-1242	100	TV 4
12672-29-6	Arocior-1248	100	F 1/2
11097-69-1	Arocior-1254	1000	7
11096-82-5	Aroclor-1260	97	J



						K40508	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT			
Contract:	91082	_	Case:	PCB	SDG:	FISH01	
Phase Type:	BIOTA	_		Lab Sample ID:	345211		
Phase Weight:	10.0	(g) _		Date Received:	10/16/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	10.0	_		Date Analyzed:	01/31/98		
% Solids:	100/m 108	_		Sulfur Clean-up:	Υ	(Y	7N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	₩ \ <u>\</u>
11104-28-2	Aroclor-1221	500	¥ (
11141-16-5	Aroclor-1232	500	₩ \/
53469-21-9	Aroclor-1242	500	W (
12672-29-6	Aroclor-1248	500	<i>1</i> 4
11097-69-1	Aroclor-1254	4900	
11096-82-5	Aroclor-1260	1000	



						K40509
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT		
Contract:	91082	-	Case:	PCB	SDG:	FISH01
Phase Type:	ВЮТА	_		Lab Sample ID:	345212	
Phase Weight:	10.0	(g)		Date Received:	10/16/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97	
Dilution Factor:	20.0	_		Date Analyzed:	01/31/98	
% Solids:	200 per jak	_		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	1000	W W
11104-28-2	Arocior-1221	1000	A M
11141-16-5	Aroclor-1232	1000	8 10
53469-21-9	Aroclor-1242	3000	7
12672-29-6	Aroclor-1248	1000	TH UT
11097-69-1	Aroclor-1254	13000	7
11096-82-5	Aroclor-1260	1300	7

						K40511	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT	L		
Contract:	91082		Case:	PCB	SDG:	FISH01	
Phase Type:	ВІОТА	_		Lab Sample ID:	345214		
Phase Weight:	10.0	(g)		Date Received:	10/16/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	5.0	_		Date Analyzed:	01/31/98		
% Solids:	2001 M 198	-		Sulfur Clean-up:	Y		Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	A M
11104-28-2	Aroclor-1221	250	THE VIEW
11141-16-5	Aroclar-1232	250	W 50
53469-21-9	Aroclor-1242	250	ت) که
12672-29-6	Aroclor-1248	1100	7
11097-69-1	Aroclor-1254	1500	3
11096-82-5	Aroclor-1260	340	-

					K40512
Lab Name:	ITS Environmental	Lab Code:	INCHVT	L	
Contract:	91082	Case:	PCB	SDG:	FISH01
Phase Type:	ВЮТА		Lab Sample ID:	345215	
Phase Weight:	10.0	(g)	Date Received:	10/16/97	
hjection Volume:	1.0	(uL)	Date Extracted:	12/17/97	
Dilution Factor:	10.0	·	Date Analyzed:	01/31/98	
% Solids:	Joger ag	_	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	B 102
11104-28-2	Aroclor-1221	500	R 12
11141-16-5	Aroclor-1232	500	W. U3
53469-21-9	Arocior-1242	500	U U
12672-29-6	Aroclor-1248	500	S) et
11097-69-1	Arocior-1254	5200	. 7
11096-82-5	Aroclor-1260	810	7

						K40513	
Lab Name:	ITS Environmental	Lab C	ode:	INCHVT			
Contract:	91082	_ _	ase:	PCB	SDG:	FISH01	
Phase Type:	BIOTA	_		Lab Sample ID:	345216		
Phase Weight:	10.0	(g)		Date Received:	10/16/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	1.0	_		Date Analyzed:	01/31/98		
% Solids:	100 M AL	- -		Sulfur Clean-up:	Υ	(Y.	/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R W
11104-28-2	Aroclor-1221	50	R 12
11141-16-5	Aroclor-1232	50	R 172
53469-21-9	Aroclor-1242	50	ייני) או
12672-29-6	Arocior-1248	330	
11097-69-1	Aroclor-1254	310	2
11096-82-5	Aroclor-1260	80	2

Lab Name:

Contract:

1.0

20/14/cg

Phase Type:

Phase Weight:

Injection Volume:

Dilution Factor:

% Solids:

EPA SAMPLE NO.

01/31/98

Y

(Y/N)

K40514 ITS Environmental Lab Code: INCHVT 91082 PCB FISH01 Case: SDG: **BIOTA** 345217 Lab Sample ID: 10.0 **(g)** 10/16/97 Date Received: 1.0 12/17/97 (uL) Date Extracted:

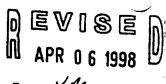
Date Analyzed:

Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	N R
11104-28-2	Aroclor-1221	50	W W
1141-16-5	Aroclor-1232	50	The real
3469-21-9	Aroclor-1242	50	8 W
12672-29-6	Aroclor-1248	530	1
11097-69-1	Aroclor-1254	370	7
11096-82-5	Aroclor-1260	71 .	7

						K40515	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT			
Contract:	91082		Case:	PCB	SDG:	FISH01	
Phase Type:	ВЮТА	_		Lab Sample ID:	345218		
Phase Weight:	10.0	(g)		Date Received:	10/16/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	10.0	_		Date Analyzed:	01/31/98		
% Solids:	100 pt ins			Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	A R
11104-28-2	Aroclor-1221	500	W W
11141-16-5	Aroclor-1232	. 500	y w
53469-21-9	Aroclor-1242	500	W W
12672-29-6	Aroclor-1248	1500	7
11097-69-1	Aroclor-1254	2100	T
11096-82-5	Aroctor-1260	560	7



EPA SAMPLE NO.

K40516 ITS Environmental Lab Name: Lab Code: INCHVT 91082 FISH01 PCB Contract: Case: SDG: **BIOTA** Phase Type: 345219 Lab Sample ID: Phase Weight: 10.0 (g) 10/16/97 **Date Received:** 1.0 Injection Volume: (uL) Date Extracted: 12/17/97 5.0 **Dilution Factor:** 01/31/98 Date Analyzed: 106 py 108 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	410
11104-28-2	Aroclor-1221	250	m ra
11141-16-5	Aroclor-1232	250	प्र पर
53469-21-9	Aroclor-1242	250	y 45
12672-29-6	Aroclor-1248	250	n 10
11097-69-1	Aroclor-1254	2000	3
11096-82-5	Aroclor-1260	350	7

						(40504-C	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT	L		
Contract:	91082	-	Case:	PC8	SDG:	FISH01	
Phase Type:	BIOTA	_		Lab Sample IO:	345420		
Phase Weight:	10.0	(g)		Date Received:	10/18/97		
jection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	3.0	_		Date Analyzed:	01/31/98		
% Solids:	108 M. 198	_		Sulfur Clean-up:	Y		Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	D) 41
11104-28-2	Aroclor-1221	150	I W
11141-16-5	Aroclor-1232	150	R M
53469-21-9	Aroclor-1242	150	क रहे
12672-29-6	Aroclor-1248	590	7
11097-69-1	Aroclor-1254	700	2
11096-82-5	Arocior-1260	150	7

			H	(40517-C
	Lab Code:	INCHVT		
	Case:	РСВ	SDG:	FISH01
		Lab Sample ID:	345421	
(g)		Date Received:	10/18/97	
(uL)		Date Extracted:	12/17/97	
_		Date Analyzed:	02/05/98	
_		Sulfur Clean-up:	Y	(Y/N)
		Case: (g)	Case: PCB Lab Sample ID: (g) Date Received: (uL) Date Extracted: Date Analyzed:	Lab Code: INCHVT Case: PCB SDG: Lab Sample ID: 345421 (g) Date Received: 10/18/97 (uL) Date Extracted: 12/17/97 Date Analyzed: 02/05/98

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	5N AF
11104-28-2	Arocior-1221	50	يم المد
11141-16-5	Aroclor-1232	50	the res
53469-21-9	Aroclor-1242	50	# W3
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11097-69-1	Aroclor-1254	200	7
11096-82-5	Aroclor-1260	39	J

						(40520-C		
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT				
Contract:	91082		Case:	PCB	SDG:	FISH01		_
Phase Type:	BIOTA	_		Lab Sample ID:	345424			
Phase Weight:	10.0	(g)		Date Received:	10/18/97			
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97			
Dilution Factor:	1.0	_		Date Analyzed:	02/05/98			
% Solids:	100 xe 10198	_		Sulfur Clean-up:	Y		(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	TR. CC
11104-28-2	Aroclor-1221	50	W V
11141-16-5	Aroclor-1232	50	18 U.
53469-21-9	Aroclor-1242	50	B U
12672-29-6	Aroclor-1248	50	٧٢ (
11097-69-1	Aroclor-1254	210	
11096-82-5	Aroclor-1260	36	J

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result'_
K40500	345205	tissue	0.5%
K40502	345207	tissue	0.6%
K40503C	345208	tissue	1.0%
K40506	345209	tissue	16.7%
K40507	345210	tissue	2.1%
K40508K	345211	tissue	3.6%
K40509	345212	tissue	10.3%
K40511	345214	tissue	4.2%
K40512	345215	tissue	3.5%
K40513	345216	tissue	5.4%_
K40514	345217	tissue	2.8%
K40515	345218	tissue	5.5%
K40516	345219	tissue	1.3%
K40504-C	345420	tissue	2.1%
K40517-C	345421	tissue	0.4%
K40518-C	345422	tissue	0.5%
K40519-C	345423	tissue	0.6%
K40520-C	345424	tissue	0.6%
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MASLAND & BOUCK ENGINEERS, P.C.

CHAIN OF CUSTODY RECORD PROJ. NO. PROJECT NAME 1 Byoli GAS 24 711 Kalamazon Rive- Resident Fish NO. SAMPLERS: (Signature) FIST OF REMARKS CON-TAINERS STA. NO. DATE TIME STATION LOCATION Morrow POND - ABSA # 2 10517-6 15 K40518.C 10/15 A40519- W 10/15 10520-L 10/15 Advit K40521 AGSATEL Molny End K40522 K40523 scules-on fillets K40524 K40525 K40526 K40527 £40528 k40529 Date / Time Received by: Isignarural Relinquished by: (Signatural Relinquished by: [Signeture] Date / Time Received by: Isignatural 10/17/97 16:50 Date / Time Received by: (Signature) Date / Time Relinquished by: (Signatural) Received by: Isignatural Date / Time Remarks Date / Time Regerred for Laboratory by: Relinquished by: (Signature)

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# FISH02

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH02 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

			Analyses				
Lab ID	Matrix	Sampling Date	VOA	BNA	РСВ	TAL	%LIPIC
345425	tissue	10/15/97			_ х		x
345426	tissue	10/15/97			x		x
345427	tissue	10/15/97			x		x
345429	tissue	10/15/97			X		х
345430	tissue	10/15/97			х		x
345431	tissue	10/15/97			x		х
345432	tissue	10/15/97			x		x
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345439	tissue	10/17/97			x		x
345440	tissue	10/17/97			×		×
345441	tissue	10/17/97			х		x
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MS/MSD performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples except K40523, K40523MS and K402523MSD were analyzed beyond the specified holding time. Based on the deviation, data for all samples except K40523, K40523MS and K40523MSD have been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for both surrogates were above control limits in the extraction blank. Since recoveries for all samples associated with the blank were acceptable, no action has been taken based on the deviation.

All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	<u> </u>		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?	X		
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>		
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	x		
If yes, were the samples reanalyzed?		X	
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	<u> </u>		
How many spike recoveries were outside of QC limits?			
O out of4			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?			×

PCB Data Review Checklist - Page 2

	YES	NO	NA_
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u> </u>		
Aroclor 1221	X		
Aroclor 1232	<u> </u>		
Aroclor 1242	<u> </u>		·
Aroclor 1248	<u> </u>		
Aroclor 1254	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	x		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	****	
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			x_
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	X		
Were there any false negatives?		X	

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limit	<u>s</u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?			X

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surro	gates
		TCX	DCB
K40521	+28		
K40522	+28		
K40523			
K40523MS			
K40523MSD			
K40525	+28		
K40526	+28		
K40527	+28		
K40528	+28		
K40529	+28		
K40530-C	+28		
K40531-C	+28		
K40532-C	+28		
K40533-C	+28		!
K40535	+25		·
K40536	+25		
K40537	+25		
K40538	+25		
K40539	+25		
K40540	+25		
	·		
		•	

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

Ð Surrogates diluted out

Recovery high Recovery low

i

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	2/04/98-	2/05/98	2/05/98					
Time:	2/05/98	1308	1335					
	Initial Cal.	Cont. Cal.	Cont. Cal.					
	%RSD	%D	%D					
Aroclor 1016	ok							
Aroclor 1221	ok							
Arocior 1232	ok							
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok						
Aroclor 1254	ok							
Aroclor 1260	ok				<u> </u>			
Tetrachloro-m-xylene	ok							
Decachiorobiphenyl	ok	<u> </u>					<u> </u>	l
Affected Samples:								
				<u> </u>				<u> </u>
						<u> </u>		
			1					}

PCB Calibration Summary - Page 2

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	2/18/98-	2/19/98	2/19/98	2/20	2/20	2/20	2/20	2/20
Time:	2/19/98	1957	2023	0141	0207	1853	1919	2251
	initial Cal.	Cont. Cal.						
	%RSD	%D						
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok						ļ	
Aroclor 1242	ok							
Aroclor 1248	ok	ok		ok		ok		ok
Aroclor 1254	ok		ok					
Aroclor 1260	ok				ok		ok	
Tetrachioro-m-xylene	ok					<u> </u>		
Decachlorobiphenyl	ok							
Affected Samples:								
								<u> </u>
						<u></u>	<u> </u>	
				5 .				
					-			

PCB Calibration Summary - Page 3

Instrument: <u>HP3327</u> Column: RTX-35 / RTX-5

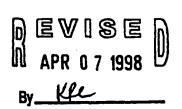
Date:	2/18/98-	2/20/98	2/23/98	2/23	2/23	2/23	2/23	2/23
Time:	2/19/98	2317	1202	1229	1745	.1812	2329	2355
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	% D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok				· · · · · · · · · · · · · · · · · · ·			
Aroclor 1232	ok							
Aroclor 1242	ok	ok						ok
Aroclor 1248	ok		ok		ok		ok	<u> </u>
Aroclor 1254	ok			ok				
Aroclor 1260	ok		-			ok		
Tetrachioro-m-xylene_	ok						ļ	
Decachlorobiphenyl	ok							
Affected Samples:				:			ļ <u> </u>	<u></u>
							 -	-
•								
							ļ	<u> </u>
								<u> </u>
								1
								1

CORRECTED ANALYSIS SUMMARY FORMS

EPA SAMPLE NO.

					(40521
Lab Name:	ITS Environmental	_ Lab Code:	INCHVT	L	
Contract:	91082	Case:	PCB	SDG:	FISH02
Phase Type:	ВЮТА	_	Lab Sample ID:	346425	
Phase Weight:	10.0	_ _ (g) _	Date Received:	10/18/97	
Injection Volume:	1,0	(uL)	Date Extracted:	12/17/97	
Dilution Factor:	1.0	_	Date Analyzed:	02/23/98	
% Solids:	JOGUR HTIMS	-	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIE	R
12674-11-2	Aroclor-1016	50	प्र	W
11104-28-2	Aroclor-1221	50	ध	U3
11141-16-5	Aroclor-1232	50	Th-	a
53469-21-9	Aroclor-1242	50	H	W
12672-29-6	Aroclor-1248	50	tk.	w
11097-69-1	Aroclor-1254	28	J	
11096-82-5	Aroclor-1260	33	J	



EPA SAMPLE NO.

	K40522	
SDG:	FISH02	_ _
245426		

ITS Environmental Lab Name: INCHVT Lab Code: 91082 PCB Contract: Case: BIOTA Phase Type: Lab Sample ID: 10.0 Phase Weight: (g) 10/18/97 **Date Received:** 1.0 (uL) 12/17/97 Injection Volume: Date Extracted: 1.0 02/23/98 **Dilution Factor:** Date Analyzed: 100 x 12 4 7 198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIE	R
12674-11-2	Aroclor-1016	50	1 1	a
11104-28-2	Aroclor-1221	50	₽.	2
11141-16-5	Aroclor-1232	50	· v	S
53469-21-9	Aroclor-1242	50	£ L	8
12672-29-6	Aroclor-1248	50	· U	ū
11097-69-1	Arocior-1254	130		7
11096-82-5	Aroclor-1260	26	J.	

000021

EPA SAMPLE NO.

K40523 ITS Environmental Lab Code: Lab Name: INCHVT 91082 PCB FISH02 Contract: Case: SDG: **BIOTA** 345427 Phase Type: Lab Sample ID: 10.0 (g) 10/18/97 Phase Weight: **Date Received:** 1.0 Injection Volume: (uL) 01/16/98 Date Extracted: 3.0 Dilution Factor: 02/19/98 Date Analyzed: 100 VE AHIAK Y % Solids: Sulfur Clean-up: (Y/N)

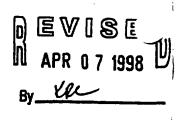
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	150	U
11096-82-5	Aroclor-1260	150	U

DEVISE Napro71998 by_______

EPA SAMPLE NO.

						K40525
Lab Name:	ITS Environmental	·-	Lab Code:	INCHVT	L	
Contract:	91082	<u>.</u>	Case:	РСВ	SDG:	FISH02
Phase Type:	BIOTA	_		Lab Sample ID:	345429	
Phase Weight:	10.0	(g)		Date Received:	10/18/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97	
Dilution Factor:	1.0	_		Date Analyzed:	02/23/98	
% Solids:	100 VR 41198	_		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	K	W
11104-28-2	Arocior-1221	50	A	Ø
11141-16-6	Aroclor-1232	50	₽.	w
53469-21-9	Aroclor-1242	50	R	Œ
12672-29-6	Aroclor-1248	50	¥.	Ū
11097-69-1	Aroclor-1254	73		7
11096-82-5	Aroclor-1260	30	J	



EPA SAMPLE NO.

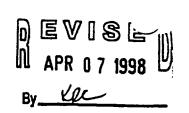
Lab Name:	ITS Environmental		Lab Code:	INCHVT	·	K40526	
Lab Name:	112 CHANOIMISHE	_	Lab Code:	INCAVI	<u> </u>		
Contract:	91082	_	Case:	PC8	SDG:	FISH02	
Phase Type:	BIOTA	_		Lab Sample ID:	345430		_
Phase Weight:	10.0	(g)		Date Received:	10/18/97		_
ijection Volume:	1.0	(UL)		Date Extracted:	12/17/97		_
Dilution Factor:	1.0	_		Date Analyzed:	02/23/98		_
% Solids:	100 VK 41148	_		Sulfur Clean-up:	Y		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Arocior-1016	50	4	a
11104-28-2	Aroclor-1221	50	الا	8
11141-16-5	Aroclor-1232	50	£.	Ø
53469-21-9	Aroclor-1242	50	71	a
12672-29-6	Aroclor-1248	50	n	W.
11097-69-1	Aroclor-1254	150		7
11096-82-5	Aroclor-1260	38	J	

EPA SAMPLE NO.

·					}	K40527	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT			
Contract:	91082		Case:	РСВ	SDG:	FISH02	
Phase Type:	BIOTA	_		Lab Sample ID:	345431		
Phase Weight:	10.0	(g)		Date Received:	10/18/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	1.0	_		Date Analyzed:	02/23/98		
% Solids:	100 VA 1146	_		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	CD UL	
11104-28-2	Aroclor-1221	50	TO US	
11141-16-5	Aroclor-1232	50	N A	
53469-21-9	Aroclor-1242	50	JJ LT	
12672-29-6	Arocior-1248	50	W B	
11097-69-1	Aroclor-1254	280	2	
11096-82-5	Aroclor-1260	63	7	

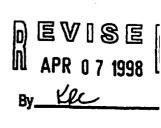


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EPA SAMPLE NO.

						K40528	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT	<u></u>		•
Contract:	91082	_	Case:	PCB	SDG:	FISH02	
Phase Type:	BIOTA	_		Lab Sample ID:	345432		
Phase Weight:	10.0	(g)		Date Received:	10/18/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	1.0	_		Date Analyzed:	02/23/98		
% Solids:	100 VR HTAY	_		Sulfur Clean-up:	Y	(Y	/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	W &
11104-28-2	Aroclor-1221	50	4 00
11141-16-5	Aroclor-1232	50	8 12
53469-21-9	Aroclor-1242	50	E CO
12672-29-6	Aroclor-1248	50	# U
11097-69-1	Aroclor-1254	120	7
11096-82-5	Arocior-1260	35	J



EPA SAMPLE NO.

K40529

ITS Environmental INCHVT Lab Name: Lab Code: 91082 **PCB** FISH02 Contract: Case: SDG: **BIOTA** Phase Type: Lab Sample ID: 345433 10.0 (g) 10/18/97 Phase Weight: **Date Received:** 1.0 (uL) Date Extracted: 12/17/97 Injection Volume: 1.0 02/23/98 **Dilution Factor:** Date Analyzed: 100 VA 17194 % Solids: Y (Y/N) Sulfur Clean-up:

COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
Aroctor-1016	50	f.	W
Aroclor-1221	50	U	T
Aroclor-1232	50	₩.	a
Aroclor-1242	50	H-	W
Aroclor-1248	60	₩.	w
Aroclor-1254	110		7
Aroclor-1260	50	. V	W
	Arocior-1016 Arocior-1221 Arocior-1232 Arocior-1242 Arocior-1248 Arocior-1254	(ug/Kg) Aroctor-1016 50 Aroctor-1221 50 Aroctor-1232 50 Aroctor-1242 50 Aroctor-1248 60 Aroctor-1254 110	(ug/Kg) Aroctor-1016 50 U Aroctor-1221 50 U Aroctor-1232 50 U Aroctor-1242 50 U Aroctor-1248 50 U Aroctor-1254 110

D E V I S E D APR 0 7 1998 U

By Kle 200075

EPA SAMPLE NO.

K40530-C Lab Name: ITS Environmental Lab Code: INCHVT 91082 Contract: PCB FISH02 Case: SDG: **BIOTA** Phase Type: 345434 Lab Sample ID: 10.0 Phase Weight: **(g)** 10/18/97 **Date Received:** 1.0 Injection Volume: (uL) 12/17/97 Date Extracted: 3.0 **Dilution Factor:** 02/23/98 Date Analyzed: 100 VP 4/ 1/98 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	150	18 W	
11104-28-2	Aroclor-1221	150	# W	
11141-16-5	Aroclor-1232	150	R M	
53469-21-9	Aroclor-1242	150	W W	
12672-29-6	Aroclor-1248	480	2	
11097-69-1	Aroclor-1254	640	7	
11096-82-5	Aroclor-1260	150	ZV 44	

EPA SAMPLE NO.

K40533-C

					سسيبيب	
Contract:	91082		Case: _	PCB	SDG:	FISH02
Phase Type:	BIOTA	_		Lab Sample IO:	345437 -	
Phase Weight:	10.0	(g)		Date Received:	10/18/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97	
Dilution Factor:	5.0	_		Date Analyzed:	02/23/98	
% Solids:	100 VAL 198	-		Sulfur Clean-up:	Y	(Y/N)

Lab Code: INCHVT

ITS Environmental

Lab Name:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	250	# W	
11104-28-2	Aroclor-1221	250	ZJ VZ	
11141-16-5	Aroclor-1232	. 250	The M	
53469-21-9	Aroclor-1242	250	IL W	
12672-29-6	Aroclor-1248	1500	7	
11097-69-1	Aroclor-1254	900	7	
11096-82-5	Aroclor-1260	260	2	

EPA SAMPLE NO.

K40535 Lab Name: ITS Environmental Lab Code: INCHVT 91082 Contract: Case: PC8 SDG: FISH02 BIOTA 345438 Phase Type: Lab Sample ID: 10.0 10/18/97 Phase Weight: (g) **Date Received:** Injection Volume: 1.0 (uL) 12/17/97 **Date Extracted:** 5.0 Dilution Factor: 02/20/98 Date Analyzed: 100 PK 41148 % Solids: Y (Y/N) Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	₹
12674-11-2	Aroclor-1016	250	-t	W
11104-28-2	Aroclor-1221	250	JL U	W
11141-16-5	Aroclor-1232	250	₩.	W
53469-21-9	Aroclor-1242	250	R	w
12672-29-6	Aroclor-1248	600		2
11097-69-1	Aroclor-1254	700		7
11096-82-5	Aroclor-1260	190	J	

EPA SAMPLE NO.

K40536 FISH02 SDG:

Lab Name: ITS Environmental Lab Code: INCHVT 91082 PCB Contract: Case: **BIOTA** 345439 Phase Type: Lab Sample ID: 10.0 (g) **Phase Weight: Date Received:** 10/18/97 1.0 Injection Volume: (uL) 12/17/97 **Date Extracted:** 1.0 02/20/98 **Dilution Factor:** Date Analyzed: 100 VELLIAR Y % Solids: (Y/N) Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	W Br	
11104-28-2	Aroclor-1221	50	ZJ LL	
11141-16-5	Aroclor-1232	50	Tr 1/2	
53469-21-9	Aroclor-1242	50	D) W	
12672-29-6	Arocior-1248	120	7	
11097-69-1	Aroclor-1254	160	77	
11096-82-5	Aroclor-1260	76	77	

EPA SAMPLE NO.

				K40537		
Lab Name:	ITS Environmental	Lab Code:	INCHVT			
Contract:	91082	Case:	PCB	SDG:	FISH02	
Phase Type:	BIOTA	_	Lab Sample ID:	345440		
l Phase Weight:	10.0	(g)	Date Received:	10/18/97		
Injection Volume:	1.0	(uL)	Date Extracted:	12/17/97		
Dilution Factor:	2.0	_	Date Analyzed:	02/20/98		
% Solids:	180 KR +1148	_	Sulfur Clean-up:	Y	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION QUAI (ug/Kg)	
12674-11-2	Aroclor-1016	100	- YB (
11104-28-2	Aroclor-1221	100	il (
11141-16-6	Aroclor-1232	100	¥ (
53469-21-9	Aroclor-1242	100	h (
12672-29-6	Aroclor-1248	100	Th.
11097-69-1	Arocior-1254	350	
11096-82-5	Arocior-1260	95	J

1112×

CHAIN OF CUSTODY

6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0068

TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO. PROJECT NAME Kalamozo River Resulent Fish 64524711 SAMPLERS: (Signalyre) eigh (the fet) STA. NO. DATE TIME COMP. STATION LOCATION REMARKS K 40504-Caliolista 14:00 New Richmond ABSA# 11 JUYENILE SM BASS Combine K-10541-12 with K-10504-CI (porsibel earlie) K 46530-C Process all Juvenile bis composite samples as K 40531-C whole-buy composites and analyze following applytion K 40532-C Proceeding riscussed previously. K 40533-chololer Lake Megan ABSA#9 Juvenile Sm Bus 10:0 Return C-1 to combine with 40534 C-2 when will fellow at al. 40534-51 X Lake Albegan ABSA#9 Adult Comp 10/7/47/10:00 K 40535 K40536 Scales-on filets) and onelyze fillets tillbring analytical. procedures described providing K40537 K40538 1440539 Lake Allegan ABSA #9 Adult Bass K40540 K40541 K40592 Relinquished by: (Siggature) Relinguished by: (Signature) TIME Received by: (Signature) Relinguished by: (Signature) 10/11/97 K:30 DATE Relinquished by: (Signature) Received by: (Signature) Relinguished by: (Signature) Relinguished by: (Signature) Relinquished by: (Signature) DATE TIME Received for Laboratory by: DATE TIME Remarks: (Signature) COPY-ORIGINAL ON FILE

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# FISH03

PCB ANALYSES

((

BIOTA

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

PCB Holding Time and Surrogate **Recovery Summary**

Sample ID	Holding Time	Surre	gates
		TCX	DCB
K40542	+26		
K40543	+26		
K40544	+29	t	
K40545	+26		
K40546	+26		
K40547	+29	· · · · · · · · · · · · · · · · · · ·	
K40548	+26		
K40549	+26		
K40550	+26		
K40552	+26		
K40553	+26		
K40554	+26		
K40555	+26		
K40556	+25		
K40557	+26		
K40568	+26		
K40569	+26		
K40570	+26		
K40571	+26		
K40572	+26		
		•	
			

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out

Recovery high

Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	2/18/98-	2/20/98	2/20/98	2/21	2/21	2/21	2/21	2/21
Time:	2/19/98	2251	2317	0435	0001	1204	1231	1748
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont.
	%RSD	%D	% D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok				·	<u> </u>		
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok		ok		ok		ok
Aroclor 1254	ok				ok			<u> </u>
Aroclor 1260	ok						_ok	
Tetrachioro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								
								1

PCB Calibration Summary - Page 2

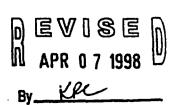
Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	2/18/98-	2/21/98	2/23/98	2/23	2/24	2/24		
Time:	2/19/98	1815	2329	2355	0141	0207		
•	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.		
	%RSD	%D	% D	%D	%D	%D		
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok	ok	*	ok				
Aroclor 1248	ok		ok		ok			
Aroclor 1254	ok					ok		
Arocior 1260	ok							
Tetrachioro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:						<u> </u>		
				r —		(1	I

CORRECTED ANALYSIS SUMMARY FORMS

Lab Name:	ITS Environmental		Lab Code:	INCHVT		K40542	
Contract:	91082	.	Case:	PC8	SDG:	FISH03	
Phase Type:	ВІОТА			Lab Sample ID:	345446		
Phase Weight:	10.0	(g)		Date Received:	10/18/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	1.0			Date Analyzed:	02/21/98		
% Solids:	100 VAC HTHE			Sulfur Clean-up:	Y	((Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIE	R
12674-11-2	Aroclor-1016	50	Th.	a
11104-28-2	Aroclor-1221	50	ধ	Ø
11141-16-5	Aroclor-1232	50	R	W
53469-21-9	Aroclor-1242	50	K	2
12672-29-6	Aroclor-1248	260		7
11097-69-1	Aroclor-1254	170		Ī
11096-82-5	Aroclor-1260	92		7



						K40543	
Lab Name:	ITS Environmental	_	ab Code:	INCHVT		· · · · · · · · · · · · · · · · · · ·	
Contract:	91082	-	Case:	PCB	SDG:	FISH03	
Phase Type:	ВЮТА	_		Lab Sample ID:	345447		
Phase Weight:	10.0	(g)		Date Received:	10/18/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	1.0	_		Date Analyzed:	02/21/98		
% Solids:	JOS YK ALTHE	_		Sulfur Clean-up:	Y		Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	10 W
11104-28-2	Aroclor-1221	50	# U3
11141-16-5	Aroclor-1232	50	W W
53469-21-9	Aroclor-1242	50	# W
12672-29-6	Aroclor-1248	170	7
11097-69-1	Aroclor-1254	150	7
11096-82-5	Aroclor-1260	43	J

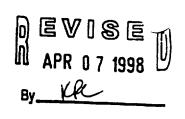
						K40544	
Lab Name:	ITS Environmental		Lab Code:	INCHVT			
Contract:	91082		Case:	PCB	SDG:	FISH03	
Phase Type:	ВЮТА			Lab Sample ID:	345448		_
Phase Weight:	10.0	(g)		Date Received:	10/18/97		_
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	4.0			Date Analyzed:	02/24/98		
% Solids:	100 KR 417198			Sulfur Clean-up:	Y		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	200	10
11104-28-2	Aroclor-1221	200	77) '8
11141-16-5	Aroclor-1232	200	En &
53469-21-9	Aroclor-1242	200	W W
12672-29-6	Aroclor-1248	930	7.
11097-69-1	Aroclor-1254	1400	J
11096-82-5	Aroclor-1260	290	7.

EPA SAMPLE NO.

K40545 ITS Environmental INCHVT Lab Name: Lab Code: 91082 **PCB** FISH03 SDG: Contract: Case: **BIOTA** 345449 Phase Type: Lab Sample ID: Phase Weight: 10.0 (g) 10/18/97 Date Received: Injection Volume: 1.0 (uL) 12/17/97 Date Extracted: 1.0 Dilution Factor: Date Analyzed: 02/21/98 100 LPC AMAY Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	ZV CL
11104-28-2	Aroclor-1221	50	N M
11141-16-5	Aroclor-1232	50	TN #
53469-21-9	Aroclor-1242	60	7
12672-29-6	Aroclor-1248	50	# W
11097-69-1	Aroclor-1254	280	7
11096-82-5	Aroclor-1260	44	J



						K40546
Lab Name:	ITS Environmental	Lab (Code:	INCHVT		
- Contract:	91082	_	Case:	РСВ	SDG:	FISH03
Phase Type:	BIOTA	_		Lab Sample (D:	345450	
Phase Weight:	10.0	(g)		Date Received:	10/18/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97	
Dilution Factor:	1.0	_		Date Analyzed:	02/21/98	
% Solids:	100 KR 4TIME	_		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	W &
11104-28-2	Aroclor-1221	50	A 10
11141-16-5	Aroclor-1232	50	W W
53469-21-9	Aroclor-1242	50	4 4
12672-29-6	Aroclor-1248	430	7
11097-69-1	Aroclor-1254	50	J. 40
11096-82-5	Aroclor-1260	110	7

	•					K40547		
Lab Name:	ITS Environmental		Lab Code:	INCHYT				
Contract:	91082	_	Case:	PCB	SDG:	FISHO3		_
Phase Type:	BIOTA	_		Lab Sample ID:	345451			
Phase Weight:	10.0	(g)		Date Received:	10/18/97			
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97			
Dilution Factor:	4.0			Date Analyzed:	02/24/98			
% Solids:	100 VALAHIAY			Sulfur Clean-up:	Y	(Y/N)	

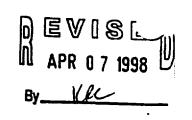
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	200	D U
11104-28-2	Aroclor-1221	200	4 12
11141-16-5	Aroclor-1232	200	410
53469-21-9	Aroclor-1242	200	4 10
12672-29-6	Aroclor-1248	1300	7
11097-69-1	Aroclor-1254	3000	7
11096-82-5	Aroclor-1260	200	TO K

					K40548
Lab Name:	ITS Environmental	Lab Code:	INCHVT		<u> </u>
Contract:	91082	Case:	PCB	SDG:	FISH03
Phase Type:	ВІОТА		Lab Sample ID:	345452	
Phase Weight:	10.0	_ _ (g)	Date Received:	10/18/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/17/97	
Dilution Factor:	1.0	- ·	Date Analyzed:	02/21/98	
% Solids:	100 CR ATTAK	-	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	CO UL
11104-28-2	Aroclor-1221	50	8 W
11141-16-5	Aroclor-1232	50	B 102
53469-21-9	Aroclor-1242	240	JN
12672-29-6	Arocior-1248	50	The May
11097-69-1	Aroclor-1254	50	R 12
11096-82-5	Aroclor-1260	110	JL

						K40549	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT			
Contract:	91082	_	Case:	PCB	SDG:	FISH03	
Phase Type:	ВЮТА	_		Lab Sample ID:	345453		
Phase Weight:	10.9	(g)		Date Received:	10/18/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	3.0	_		Date Analyzed:	02/21/98		
% Solids:	SALVEL MINE	_		Sulfur Clean-up:	Y	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	W W
11104-28-2	Aroclor-1221	150	& M
11141-16-5	Aroclor-1232	150	WW
63469-21-9	Aroclor-1242	150	400
12672-29-6	Aroclor-1248	150	40
11097-69-1	Aroclor-1254	1000	JA
11096-82-5	Arocior-1260	150 .	11 10

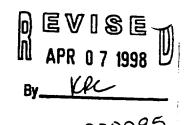


					K40550
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	РСВ	SDG:	FISH03
Phase Type:	BIOTA		Lab Sample ID:	345454	
Phase Weight:	10.0	(g)	Date Received:	10/18/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/17/97	
Dilution Factor:	1.0		Date Analyzed:	02/21/98	
% Solids:	100 KRC 417148	•	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	THE WO
11104-28-2	Aroclor-1221	50	# 10
11141-16-5	Aroclor-1232	50	B 00
53469-21-9	Aroclor-1242	50	WW
12672-29-6	Aroclor-1248	270 sso	7
11097-69-1	Aroclor-1254	230 50	JV J
11096-82-5	Aroclor-1260	GO 120	7

						K40552	
Lab Name:	ITS Environmental	_	Lab Gode:	INCHVT	Ĺ		
Contract:	91082	_	Case:	PCB	SDG:	FISH03	
Phase Type:	BIOTA	_		Lab Sample ID:	345510		
Phase Weight:	10.0	(g)		Date Received:	10/23/97		
jection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	3.0			Date Analyzed:	02/21/98		
% Solids:	100 YEL A11198	-	•	Sulfur Clean-up:	Y	n	Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	W W
11104-28-2	Aroclor-1221	150	IN VO
11141-16-5	Arocior-1232	150	W W
53469-21-9	Aroclor-1242	150	w w
12672-29-6	Aroclor-1248	150	\$ W
11097-69-1	Aroclor-1254	150	\$ W
11096-82-5	Aroclor-1260	270	JN



						K40553	
Lab Name:	ITS Environmental	_	ab Code:	INCHVT			
Contract:	91082	_	Case:	РСВ	SDG:	FISH03	 -
Phase Type:	BIOTA	_		Lab Sample ID:	345511		
Phase Weight:	10.0	(g)		Date Received:	10/23/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97	_	
Dilution Factor:	1.0	_		Date Analyzed:	02/21/98		
% Solids:	200 KR AITIAK	-		Sulfur Clean-up:	Υ		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	SN &	
11104-28-2	Aroclor-1221	50	A M	
11141-16-5	Aroclor-1232	50	W W	
53469-21-9	Aroclor-1242	50	a m	
12672-29-6	Aroclor-1248	50	W W	
11097-69-1	Aroclor-1254	87	7	
11096-82-5	Aroclor-1260	34	J	

						K40554	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT	Ĺ		
Contract:	91082	-	Case:	PCB	SDG:	FISH03	
Phase Type:	BIOTA	_		Lab Sample ID:	345512		
Phase Weight:	10.0	(g)		Date Received:	10/23/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	3.0	-		Date Analyzed:	02/21/98		
% Solids:	100 CE 417198			Sulfur Clean-up:	Y	(Y/N)

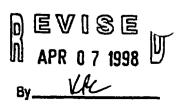
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)		QUALIFIER
12674-11-2	Aroclor-1016	150		N W
11104-28-2	Aroclor-1221	150		W 10
11141-16-5	Aroclor-1232	150		少场
53469-21-9	Aroclor-1242	150		EN AL
12672-29-6	Aroclor-1248	150		EN IK
11097-69-1	Aroclor-1254	190		4
11096-82-5	Aroclor-1260	460	,	Z

					K40555
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	РСВ	SDG:	FISH03
Phase Type:	ВЮТА		Lab Sample fO:	345513	
Phase Weight:	10.0	(g)	Date Received:	10/23/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/17/97	
Dilution Factor:	2.0		Date Analyzed:	02/21/98	
% Solids:	100 KR 47198		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	100	N W	
11104-28-2	Aroclor-1221	100	R 1/2	
11141-16-5	Aroclor-1232	100	20 R	
53469-21-9	Aroclor-1242	100	4 W	
12672-29-6	Aroclor-1248	100	W W	
11097-69-1	Aroclor-1254	310	7	
11096-82-5	Aroclor-1260	80	J	

Lab Name:	ITS Environmental		Lab Code:	INCHVT		K40556
			Cas Code.		Ļ	
Contract:	91082		Case:	PC8	SDG:	FISH03
Phase Type:	BIOTA	_		Lab Sample ID:	345514	
Phase Weight:	10.0	- (g)		Date Received:	10/23/97	
jection Volume:	1.0	(uL)		Date Extracted:	12/17/97	
Dilution Factor:	1.0	_		Date Analyzed:	02/21/98	
% Solids:	100 KR 417 198	-		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroctor-1016	50	W W
11104-28-2	Aroclor-1221	50	# 45
11141-16-5	Aroclor-1232	50	\$ 15
53469-21-9	Aroclor-1242	50	الله الله
12672-29-6	Aroclor-1248	50	W 10
11097-69-1	Arocior-1254	520	7
11096-82-5	Aroclor-1260	100	7



					K40557
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	РСВ	SDG:	FISH03
Phase Type:	BIOTA		Lab Sample ID:	345515	
Phase Weight:	10.0	(g)	Date Received:	10/23/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/17/97	
Dilution Factor:	1.0		Date Analyzed:	02/21/98	
% Solids:	100 KR AHIAK		Sulfur Clean-up:	Y	(Y/N)

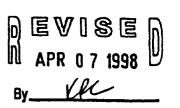
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	\$ V5
11104-28-2	Aroclor-1221	50	8 VJ
11141-16-5	Aroclor-1232	50	W W
53469-21-9	Aroclor-1242	50	D VO
12672-29-6	Aroclor-1248	50	46
11097-69-1	Aroclor-1254	140	7
11096-82-5	Aroclor-1260	32	J

Lab Name:	ITS Environmental		I ab Cadas	INCHVT		K40568	
Lab Name:	112 CITALI OLIMICIWAL	•	Lab Code:	INCRVI	L		
Contract:	91082	•	Case:	РСВ	SDG:	FISH03	
Phase Type:	вюта			Lab Sample ID:	345516		
Phase Weight:	10.0	(g)		Date Received:	10/23/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/17/97		
Dilution Factor:	1.0			Date Analyzed:	02/21/98		
% Solids:	100 KK AMAI			Sulfur Clean-up:	Y		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	8 V5
11104-28-2	Aroclor-1221	50	W W
11141-16-5	Aroclor-1232	50	8 12
53469-21-9	Aroclor-1242	50	W W
12672-29-6	Aroclor-1248	110	3
11097-69-1	Arocior-1254	140	7
11096-82-5	Arocior-1260	58	7

] '	K40569
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
· Contract:	91082	Case:	PC8	SDG:	FISH03
Phase Type:	ВЮТА		Lab Sample ID:	345517	
Phase Weight:	10.0	(g)	Date Received:	10/23/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/17/97	
Dilution Factor:	5.0		Date Analyzed:	02/21/98	
% Solids:	100 KR anias		Sulfur Clean-up:	Y	(Y/N)

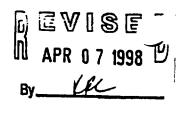
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	1 W
11104-28-2	Aroclor-1221	250	A W
11141-16-5	Aroclor-1232	250	W &
53469-21-9	Aroclor-1242	250	# 10
12672-29-6	Aroclor-1248	250	W W
11097-69-1	Arocior-1254	1400	7
11096-82-5	Aroclor-1260	250 .	J



EPA SAMPLE NO.

K40570 ITS Environmental **WCHVT** Lab Name: Lab Code: 91082 **PCB** FISH03 Case: Contract: SDG: **BIOTA** 345518 Phase Type: Lab Sample IO: 10.0 (g) Date Received: 10/23/97 Phase Weight: 1.0 Injection Volume: (uL) 12/17/97 Date Extracted: 3.0 02/21/98 **Dilution Factor:** Date Analyzed: 100 KR 41198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	4 45
11104-28-2	Aroclor-1221	150	D IL
11141-16-5	Aroclor-1232	150	W W
53469-21-9	Aroclor-1242	150	D 40
12672-29-6	Aroclor-1248	150	# W
11097-69-1	Aroclor-1254	730	7
11096-82-5	Aroctor-1260	180	7



MANUE

EPA SAMPLE NO.

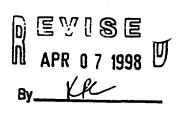
K40571 ITS Environmental Lab Name: Lab Code: MCHVT 91082 PC8 FISH03 Contract: SDG: Case: BIOTA Phase Type: 345519 Lab Sample ID: 10.0 Phase Weight: (g) 10/23/97 Date Received: 1.0 Injection Volume: (uL) Date Extracted: 12/17/97 1.0 02/21/98 **Dilution Factor:** Date Analyzed: 100 KRAMAR Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Arocior-1016	50	W &
11104-28-2	Aroclor-1221	50	TO B
11141-16-5	Aroclor-1232	50	# WJ
53469-21-9	Aroclor-1242	50	W W
12672-29-6	Arocior-1248	150	7
11097-69-1	Aroclor-1254	370	3
11096-82-5	Aroclor-1260	47	J

EPA SAMPLE NO.

						K40572
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT	L	
Contract:	91082	_	Case:	РСВ	SDG:	FISH03
Phase Type:	BIOTA	_		Lab Sample ID:	345520	
Phase Weight:	10.0	(g)		Date Received:	10/23/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/17/97	
Dilution Factor:	1.0	_		Date Analyzed:	02/21/98	
% Solids:	MYRCANAR	_		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	1 1 VO
11104-28-2	Aroclor-1221	50	W W
11141-16-5	Aroclor-1232	50	8 M
53469-21-9	Aroclor-1242	50	W W
12672-29-6	Aroclor-1248	190	7
11097-69-1	Aroclor-1254	300	1 3
11096-82-5	Aroclor-1260	88	3



00018/

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample 1D	Lab ID	Matrix	Result [*]
K40542	345446	tissue	0.4%
K40543	345447	tissue	1.4%
K40544	345448	tissue	0.3%
K40545	345449	tissue	0.8%
K40546	345450	tissue	0.7%
K40547	345451	tissue	0.6%
K40548	345452	tissue	0.3%
K40549	345453	tissue	0.7%
K40550	345454	tissue	0.7%
K40552	345510	tissue	0.4%
K40553	345511	tissue	0.2%
K40554	345512	tissue	1.0%
K40555	345513	tissue	0.6%
K40556	345514	tissue	0.8%
K40557	345515	tisue	0.3%
K40568	345516	tissue	0.4%
K40569	345517	tissue	1.1%
K40570	345518	tissue	0.3%
K40571	345519	tissue	0.3%
K40572	345520	tissue	0.4%
		,	
		* * * * * * * * * * * * * * * * * * *	

CHAIN OF CUSTODY



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO. | PROJECT NAME Kalamoza River Resident Tish 32.2 64524711 SAMPLERS: (Signalure) CHI (May); STÁ NO. DATE COMP. TIME STATION LOCATION REMARKS 40564-CZ 1011497 14:00 New Richmond ABSA# 11 Juyanile SM Bass Combine Kilosulica with Kilosof-CI (possibel exches) 40530-6 Process will Julinile boss composite samples as whole king composites and analyze to besing analytic K 40531-C K140532-C Placedure discussed previously= Lak Alegan ABSA#9 Juvenile Sm Boss 40533-c 10/17/97 10:0 Return C-1 to Leambine with 40534 C-2 Wheh will Albura 40534-61 Fillet carp (SKm-off Fillets) and lass (SKm-on, X Lala Allegan ABSA#9 Advit Comp 101197 10:00 40535 Scules - on filials) and onelyze tillets tillowing K4053 L analytical products discussed provously K40537 K40538 1440537 K40540 Lake Allegan 1954 #9 Adult Bris K40541 TIME | Rollinguished by: (Signature) Relinquished by: (Signature) Relinguished by: (Signature) DATE TIME Received by: (Signature) DATE DATE TIME DATE TIME Relinguished by: (Signature) Relinquished by: (Signature) Received by: (Signature) Relinquished by: (Signature) Received for Laboratory by: TIME Remarks: DATE DATE TIME Relinquished by: (Signature) (Sidnature) copy opiningl on file



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

Proj. No. <u>845 247//</u> Sampler		CT NAM		<u>(162.6</u>	River	Risa	land figh	77	Sign X	A COM	Street.			7		//	/	
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K40546											1				(3K)	<u>n-m, S</u> പഹ് <u>യ</u> ഒ	naly to	up (SKin-of fillots) and bess un) and analyze fillots und proceedings discussed
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DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# FISH04

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH04 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

				Analyses				
Sample ID	Lab ID	Matrix	Sampling Date	VOA	BNA	РСВ	TAL	%LIPID
K40573	345521	tissue	10/21/97			X		x
K40574	345522	tissue	10/21/97			x		×
K40551-C	345523	tissue	10/20/97			x		х
K40564-C	345524	tissue	10/21/97			x		×
K40565-C	345525	tissue	10/21/97			х		x
K40566-C	345526	tissue	10/21/97			x		х
K40567-C	345527	tissue	10/21/97			×		x
K40558	345528	tissue	10/20/97			×		×
K40559	345529	tissue	10/20/97			x		х
K40560	345530	tissue	10/20/97			x		x
K40561	345531	tissue	10/20/97	<u> </u>		×		×
K40562	345532	tissue	10/20/97			х		x
K40563	345533	tissue	10/20/97			×		×
K40575	345534	tissue	10/21/97	<u> </u>		x	<u> </u>	×
K40576	345535	tissue	10/21/97			x		×
K40577	345536	tissue	10/21/97			×		x
K40578	345537	tissue	10/21/97			x		x
K40579	345538	tissue	10/21/97			х		x
K40580	345539	tissue	10/21/97			×		x
K40582	345540	tissue	10/21/97	*		x		×
						<u></u>		

PCB ANALYSES

PCB Data Review Checklist - Page 2

	YES	NO	NA_
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u> </u>		
Aroclor 1221	<u> </u>		
Aroclor 1232	<u> </u>		
Aroclor 1242	X		
Aroclor 1248	<u> </u>		
Aroclor 1254	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	X		<u></u>
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		·
Do the combined column and individual column Aroclor identifications agree?	x		· .
Were there any false negatives?		X	

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limits	<u> E</u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?			X

EPA SAMPLE NO.

						K40574
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT		
Contract:	91082	-	Case:	РСВ	SDG:	FISH04
Phase Type:	BIOTA	_		Lab Sample ID:	345522	
Phase Weight:	10.3	(g)		Date Received:	10/23/97	
Injection Volume:	1.0	(uL)		Date Extracted:	02/23/98	
Dilution Factor:	1.0			. Date Analyzed:	03/05/98	
% Solids:	100 LL HEIGE			Sulfur Clean-up:	Y	(Y/N)

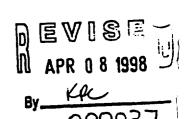
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	υ
12672-29-6	Aroclor-1248	130	
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	53	



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					K	(40551-C	
Lab Name:	ITS Environmental	-	Lab Code:	INCHVT	L		
Contract:	91082	-	Case:	PCB	SDG:	FISH04	
Phase Type:	ВЮТА	_		Lab Sample ID:	345523		_
Phase Weight:	10.0	(g)		Date Received:	10/23/97		_
Injection Volume:	1.0	(uL)		Date Extracted:	02/26/98		
Dilution Factor:	2.0	_		Date Analyzed:	03/05/98		
% Solids:	100 14 14/68			Sulfier Clean-un:	Y		· (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	100	U
12672-29-6	Aroclor-1248	100	U
11097-69-1	Aroclor-1254	220	
11096-82-5	Aroclor-1260	190	U



				K40564-C		
Lab Name:	ITS Environmental	Lab Code	: INCHVT			
Contract:	91082	Case	: PC8	SDG:	FISH04	
Phase Type:	BIOTA		Lab Sample ID:	345524		
Phase Weight:	10.0	(g)	Date Received:	10/23/97		
njection Volume:	1.0	(uL)	Date Extracted:	02/26/98		
Dilution Factor:	5.0		Date Analyzed:	03/05/98		
% Solids:	100 VR 418188		Sulfur Clean-up:	Y	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	U
11104-28-2	Aroclor-1221	250	U
11141-16-5	Aroclor-1232	250	U
53469-21-9	Aroclor-1242	250	U
12672-29-6	Aroclor-1248	350	
11097-69-1	Aroclor-1254	640	
11096-82-5	Aroclor-1260	220	J

EPA SAMPLE NO.

K40565-C

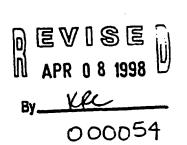
ITS Environmental INCHVT Lab Name: Lab Code: 91082 PCB FISH04 Contract: Case: SDG: **BIOTA** 345525 Phase Type: Lab Sample ID: 10.0 (g) Phase Weight: **Date Received:** 10/23/97 1.0 (uL) 02/26/98 Injection Volume: Date Extracted: 10.0 03/05/98 **Dilution Factor:** Date Analyzed: 100 KPC 418198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Arocior-1242	500	U
12672-29-6	Aroclor-1248	700	
11097-69-1	Aroctor-1254	440	J
11096-82-5	Aroclor-1260	500	u

EPA SAMPLE NO.

				к	40566-C
Lab Name:	ITS Environmental	Lab Code:	INCHVT		· · · · · · · · · · · · · · · · · · ·
Contract:	91082	Case:	PCB	SDG:	FISH04
Phase Type:	BIOTA		Lab Sample ID:	345526	
Phase Weight:	10.1	(g)	Date Received:	10/23/97	
Injection Volume:	1.0	(uL)	Date Extracted:	02/26/98	
Dilution Factor:	3.0		Date Analyzed:	03/05/98	
% Solids:	100 VAC 11/18		Sulfur Clean-up:	Υ	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Arocior-1232	150	U
53469-21-9	Arocior-1242	150	U
12672-29-6	Aroclor-1248	670	
11097-69-1	Aroclor-1254	660	
11096-82-5	Aroclor-1260	170	



EPA SAMPLE NO.

K40567-C

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	FISH04
Phase Type:	ВЮТА		Lab Sample ID:	345527	
Phase Weight:	10.0	(g)	Date Received:	10/23/97	
Injection Volume:	1.0	(uL)	Date Extracted:	02/26/98	
Dilution Factor:	2.0		Date Analyzed:	03/05/98	•
% Solids:	100 VAC 418/18		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	100	U
12672-29-6	Aroclor-1248	320	
11097-69-1	Aroclor-1254	190	
11096-82-5	Aroclor-1260	100	U

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EPA SAMPLE NO.

						K40558
Lab Name:	ITS Environmental		Lab Code:	INCHVT	L	
Contract:	91082		Case:	PCB	SDG:	FISH04
Phase Type:	BIOTA			Lab Sample ID:	345528	
Phase Weight:	10.0	(g)		Date Received:	10/23/97	
Injection Volume:	1.0	(uL)		Date Extracted:	02/26/98	
Dilution Factor:	1.0			Date Analyzed:	03/05/98	
% Solids:	100 xec 4/8/98			Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroctor-1242	50	U
12672-29-6	Aroclor-1248	50	Ū
11097-69-1	Aroclor-1254	72	
11096-82-5	Aroclor-1260	50	U

000072

EPA SAMPLE NO.

K40559

ITS Environmental INCHVT Lab Name: Lab Code: 91082 FISH04 Case: **PCB** Contract: SDG: **BIOTA** Phase Type: Lab Sample ID: 345529 10.0 Phase Weight: (g) 10/23/97 **Date Received:** 1.0 (uL) 02/23/98 Injection Volume: Date Extracted: 1.0 03/05/98 **Dilution Factor:** Date Analyzed: 100 KR 418198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	. 50	U
11104-28-2	Aroclor-1221	50	Ü
11141-16-5	Aroclor-1232	50	u
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	Ü
11097-69-1	Aroclor-1254	28	J
11096-82-5	Aroclor-1260	50	U

00008

INCHVT

PC8

Date Analyzed:

Sulfur Clean-up:

Lab Code:

(g)

(uL)

Case:

ITS Environmental

91082

BIOTA

10.2

1.0

1.0

100 xx 418198

Lab Name:

Contract:

Phase Type:

Phase Weight:

Injection Volume:

Dilution Factor:

% Solids:

EPA SAMPLE NO.

ντ		K40560	
PCB	SDG:	FISH04	<u> </u>
Lab Sample ID:	345530)	
Date Received:	10/23/97	7	
Date Extracted:	02/23/91	3	

03/05/98

Υ

(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	49	U
11097-69-1	Aroclor-1254	78	
11096-82-5	Aroclor-1260	49	Ü

EPA SAMPLE NO.

K40561

ITS Environmental INCHVT Lab Name: Lab Code: 91082 PCB FISH04 Contract: Case: SDG: **BIOTA** 345531 Phase Type: Lab Sample ID: 10.2 (g) 10/23/97 Phase Weight: **Date Received:** 1.0 (uL)02/23/98 Injection Volume: Date Extracted: 1.0 03/05/98 Dilution Factor: Date Analyzed: 100 xpc 418198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	Ú
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	49	Ü
11097-69-1	Aroclor-1254	100	
11096-82-5	Aroclor-1260	72	

000099

EPA SAMPLE NO.

	TO 5					K40562	
Lab Name:	ITS Environmental		Lab Code:	INCHVT	Ł		
Contract:	91082		Case:	PCB	SDG:	FISH04	
Phase Type:	BIOTA			Lab Sample ID:	345532		
Phase Weight:	10.1	(g)		Date Received:	10/23/97		
Injection Volume:	1.0	(uL)		Date Extracted:	02/23/98		
Dilution Factor:	1.0			Date Analyzed:	03/05/98		
% Solids:	100 KR 4/8/98			Sulfur Clean-up:	Y	(Y//	N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Arocior-1016	50	Ü
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	Ü
12672-29-6	Aroclor-1248	. 50	U
11097-69-1	Aroclor-1254	44	J
11096-82-5	Aroclor-1260	50	U



EPA SAMPLE NO.

K40563

ITS Environmental MCHVT Lab Name: Lab Code: 91082 SDG: FISH04 Case: PC8 Contract: BIOTA 345533 Phase Type: Lab Sample ID: 10.1 (g) 10/23/97 Phase Weight: **Date Received:** 1.0 (uL) 02/23/98 Injection Volume: **Date Extracted:** 1.0 03/05/98 **Dilution Factor: Date Analyzed:** 100 cec 4/8/48 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	Ü
11104-28-2	Aroclor-1221	50	. U
11141-16-5	Aroclor-1232	50	Ü
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	83	
11096-82-5	Aroclor-1260	50	U

000117

AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

				·		K40575
Lab Name:	ITS Environmental		Lab Code:	INCHVT		
Contract:	91082		Case:	РСВ	SDG:	FISH04
Phase Type:	BIOTA			Lab Sample ID:	345534	
Phase Weight:	10.0	(g)		Date Received:	10/23/97	
Injection Volume:	1.0	(uL)		Date Extracted:	02/23/98	
Dilution Factor:	3.0			Date Analyzed:	03/05/98	
% Solids:	200 KRC 418198			Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	150	U

EPA SAMPLE NO.

	K40576	
SDG:	FISH04	
245535		

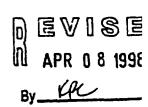
Lab Name: ITS Environmental INCHVT Lab Code: 91082 Contract: Case: **PCB** BIOTA Phase Type: Lab Sample ID: 345535 10.0 Phase Weight: (g) Date Received: 10/23/97 1.0 Injection Volume: (uL) Date Extracted: 02/23/98 1.0 03/05/98 **Dilution Factor:** Date Analyzed: 100 KPC 418198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	U	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	180		
11097-69-1	Aroclor-1254	140		
11096-82-5	Aroclor-1260	34	J	

EPA SAMPLE NO.

. Lab Name	ITS Environmental					<40577
Lab Name:	112 EUAILOIMISEU(SI		Lab Code:	INCHVT	L	
Contract:	91082		Case:	РСВ	SDG:	FISH04
Phase Type:	ВЮТА			Lab Sample ID:	345536	
Phase Weight:	10.0	(g)		Date Received:	10/23/97	
Injection Volume:	1.0	(uL)		Date Extracted:	02/23/98	
Oilution Factor:	1.0			Date Analyzed:	03/05/98	
% Solids:	100 KR 4/8/48			Sulfur Clean-up:	Y	(Y/N)

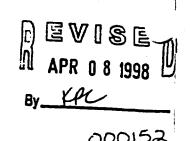
CAS NO.	COMPOUND	CONCENTRATION QUAL (ug/Kg)	
12674-11-2	Aroclor-1016	50	Ú
11104-28-2	Arocior-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	140	
11097-69-1	Aroclor-1254	150	
11096-82-5	Aroclor-1260	31	J



EPA SAMPLE NO.

K40578 ITS Environmental INCHVT Lab Name: Lab Code: 91082 PCB SDG: FISH04 **Contract:** Case: **BIOTA** 345537 Phase Type: Lab Sample ID: 10.0 (g) 10/23/97 Phase Weight: **Date Received:** 1.0 02/23/98 (uL) Injection Volume: Date Extracted: 1.0 03/05/98 **Dilution Factor:** Date Analyzed: 100 KRC 418198 Υ. (Y/N) % Solids: Suffur Clean-up:

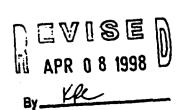
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	Ü
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	130	
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	250	
11096-82-5	Aroclor-1260	50	U



EPA SAMPLE NO.

					K40579
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case	РСВ	SDG:	FISH04
Phase Type:	ВЮТА		Lab Sample ID:	345538	
Phase Weight:	10.0	(g)	Date Received:	10/23/97	
injection Volume:	1.0	(uL)	Date Extracted:	02/23/98	
Dilution Factor:	1.0		Date Analyzed:	03/05/98	
% Solids:	100 KRL 418/98		Sulfur Clean-up:	Υ	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION Q	
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	98	
11097-69-1	Aroclor-1254	170	
11096-82-5	Aroclor-1260	33	J



INCHVT

EPA SAMPLE NO.

K40580

SDG: FISH04

Contract: 91082 Case: PCB

Phase Type: BIOTA Lab Sample ID:

Phase Weight: 10.0 (g) Date Received:

Injection Volume: 1.0 (uL) Date Extracted:

ITS Environmental

Lab Name:

Date Received: 10/23/97

Date Extracted: 02/23/98

Date Analyzed: 03/05/98

 Dilution Factor:
 1.0
 Date Analyzed:
 03/05/98

 % Solids:
 1957/K 418/18
 Sulfur Clean-up:
 Y
 (Y/N)

Lab Code:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	U	
11104-28-2	Aroclor-1221	50	u	
11141-16-5	Aroclor-1232	50	Ü	
53469-21-9	Aroclor-1242	50	J	
12672-29-6	Arocior-1248	50	U	
11097-69-1	Aroclor-1254	110		
11096-82-5	Aroclor-1260	50	U	

000170

EPA SAMPLE NO.

					K40581
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	_ Case:	РСВ	SDG:	FISH04
Phase Type:	BIOTA		Lab Sample ID:	345540	
Phase Weight:	10.0	(g)	Date Received:	10/23/97	
njection Volume:	1.0	(uL)	Date Extracted:	02/23/98	
Dilution Factor:	1.0	_	Date Analyzed:	03/05/98	
% Solids:	100 KR 418498	•	Sulfur Clean-up:	Y	(Y/N)

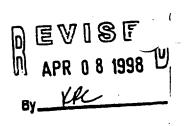
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	. 50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	150	
11097-69-1	Aroclor-1254	160	
11096-82-5	Aroclor-1260	50	U

EPA SAMPLE NO.

K40581MS

					.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Lab Name:	ITS Environmental	Lab Code:	INCHVT	L	
Contract:	91082	Case:	PCB	SDG: _	FISH04
Phase Type:	BIOTA	,	Lab Sample ID:	345540M	s
Phase Weight:	10.0	(g)	Date Received:	10/23/97	
Injection Volume:	1.0	(uL)	Date Extracted:	02/23/98	
Dilution Factor:	10.0		Date Analyzed:	03/05/98	
% Solids:	108 KR 418198		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	6100	
12672-29-6	Aroclor-1248	500	U
11097-69-1	Aroclor-1254	6200	
11096-82-5	Aroclor-1260	500	U



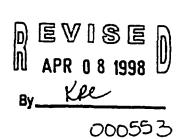
000544

AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

				K40581MSI	D
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	РСВ	SDG: FISHO	4
Phase Type:	BIOTA		Lab Sample ID:	345540 MD	
Phase Weight:	10.0	(9)	Date Received:	10/23/97	_
njection Volume:	1.0	(uL)	Date Extracted:	02/23/98	_
Dilution Factor:	10.0		Date Analyzed:	03/05/98	_
% Solids:	100 KRC 418198		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	5400	
12672-29-6	Aroclor-1248	500	U
11097-69-1	Aroclor-1254	5500	
11096-82-5	Aroclor-1260	500	U



PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result
K40574	345522	tissue	0.3%
K40551-C	345523	tissue	1.6%
K40564-C	345524	tissue	2.4%
K40565-C	345525	tissue	2.9%
K40566-C	345526	tissue	2.2%
K40567-C	345527	tissue	3.2%
K40558	345528	tissue	0.6%
K40559	345529	tissue	0.2%
K40560	345530	tissue	0.4%
K40561	345531	tissue	0.3%
K40562	345532	tissue	0.4%
K40563	345533	tissue	0.3%
K40575	345534	tissue	0.5%
K40576	345535	tissue	0.6%
K40577	345536	tissue	0.4%
K40578	345537	tissue	0.7%
K40579	345538	tissue	0.3%
K40580	345539	tissue	0.4%
K40582	345540	tissue	0.4%

CHAIN OF CUSTODY



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 448-9120 SDG # FISHO3 FTR 4 67086

CHAIN OF CUSTODY RECORD

PROJ. NO. PROJECT NAME Kalamaza River NRIMP Resident Fish 64521711 **BAMPLERS: (Signature)** STA NO. DATE TIME COMP. STATION LOCATION REMARKS Fillet (SKin-off fillets) and analyze following analytical Proceedings discussed proximity Like Alleyan - Gop K40568 10/21/07 14:0 K40567 <u>| K40570</u> K40571 K40572 K40573 K40574 Relinguished by: (Signature) Relinguished by: (Signature) DATE Relinquished by: (Signature) TIME Received by: (Signature) DATE DATE TIME Relinguished by: (Signature) DATE TIME Relingulahed by: (Signature) Received by: (Signature) Relinguished by: (Signature) DATE DATE TIME Received for Laboratory by: Remarks: Relinquished by: (Signature) (Signature) 10-23-97 0930



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066

TEL: (315) 448-9120

CHAIN OF CUSTODY RECORD

PROJ. NO. PROJECT NAME Kolemazo River NRMP Resident Fish 64524711 SAMPLERS: (Skinetute) 2 STA. NO. DATE TIME COMP. **GRAB** STATION LOCATION REMARKS Kylo SSire K42351-C 10/2497 16:0 Marrow Pard Juranile Bass K 40564-510121157 14.0 Lake Alleran Jureale Gass K 40545-C K140566-C K 40567-C Morrow Bral K40558 10/2407 11: 1. SM Bess K45159 4.46560 1. 43 541 **K4356**4 K42563 K40 515 Klader 1015 Like Allerin Bass K4051+ Reilinquished by: (Signature) DATE TIME | Received by: (Signature) Relinguished by: (Signature) DATE TIME Relinguished by: (Signature) 12:00 Relinquished by: (Signature) TIME Received by: (Signature) Relinguished by: (Signature) DATE TIME Relinquished by: (Signature) Relinquished by: (Signature) TIME Received for Laboratory by: DATE TIME DATE Remarks: (Signature) 09.30 10-23-97 y to Comminator File Dis'



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO.	Stel	2006	_Kv		,	Risal	at 1764		3	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Sept 1					,			900000
STA. NO.	DATE	TIME	COMP.	GRAB	-16.	STAT	ION LOCATIO	N		The state of the s		1873v)					·	REMARKS	3	00
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K-10577	1	1		1								11_			tilla	مدكرد	celvte	l fixed	see disa	seel
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K-10581				1		L				ر د او	川				1					
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DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# FISH05

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH05 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

				Analyses				
Sample ID	Lab ID	Matrix	Sampling Date	VOA	BNA	РСВ	TAL	%LIPID
K40584	345983	tissue	10/23/97			x		×
K40585	345984	tissue	10/23/97			×		×
K40586	345985	tissue	10/23/97	<u></u>	<u></u>	x	ļ	x
K40587	345986	tissue	10/23/97			х		x
K40595	345987	tissue	10/23/97			х		x
K40588	345988	tissue	10/23/97			x		x
K40589	345989	tissue	10/23/97			x		х
K40590	345990	tissue	10/23/97			х		Х
K40591	345991	tissue	10/23/97			x		x
K40592	345992	tissue	10/23/97			x		х_
K40593	345993	tissue	10/23/97			x		x
K40594	345994	tissue	10/230/97			×		x
K40505	345995	tissue	10/14/97			x		x
K40596	345996	tissue	10/14/97			x		x
K40597	345997	tissue	10/14/97			x		х
K40598	345998	tissue	10/14/97			x		х
K40599	345999	tissue	10/14/97			х		х
K40600	346000	tissue	10/14/97			x		x_
K40601	346001	tissue	10/14/97			х		х
K60202	346002	tissue	10/14/97	6:		x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed beyond the specified holding time. Based on the deviation, all data has been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for one surrogate was below control limits in sample K40587. Since recovery for the remaining surrogate was within control limits, no data has been qualified based on the deviation. Surrogates were diluted beyond the range of detection in samples K40584 and K40505. No data have been qualified based on diluted surrogates. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?	X		
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		X	
Matrix Spikes			
Is there a matrix spike recovery form present?		X	
Were matrix spikes analyzed at the required frequency?		X	
How many spike recoveries were outside of QC limits?			٠
<u>NA</u> out of <u>NA</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
NA out of NA			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?	<u> </u>		X
Are there field/rinse/equipment blanks associated with every sample?			X

PCB Data Review Checklist - Page 2

	YES	NO	NA
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	X	-	
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	x		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	x		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check		•	
Is a analytical sequence form present and complete for each column and each period of analyses?	X		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			x_
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	X		
Were there any false negatives?		X	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limits	<u> </u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?			X

PCB Holding Time and Surrogate **Recovery Summary**

Sample ID	Holding Time	Surro	gates
<u>.</u>		тсх	DCB
K40584	+25	D	D
K40585	+25		
K40586	+25		
K40587	+25	1	
K40595	+25		
K40588	+25		
K40589	+25		
K40589	+25		
K40591	+25		
K40592	+25		
K40593	+25		
K40594	+25		
K40505	+25	D	0
K40596	+25		
K40597	+25		
K40598	+25		
K40599	+25		
K40600	+26		
K40601	+26	<u>-</u>	
K40602	+26		
	1	•	

Surrogate Standards
TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:

Surrogates diluted out Recovery high Recovery low D

t

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	2/18/98-	2/21/98	2/21/98	.2/21	2/21	2/21	2/21	2/22
Time:	2/19/98	1204	1231	1748	1815	2332	2358	0211
•	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok				···			
Aroclor 1232	ok				- 			<u></u>
Aroctor 1242	ok				ok			
Arocior 1248	ok	ok_		ok				ok
Aroclor 1254	ok					ok	ok_	
Aroclor 1260	ok		ok				<u> </u>	
Tetrachioro-m-xylene	ok	 						
Decachlorobiphenyl	ok							
Affected Samples:								
								<u> </u>
								
-								<u> </u>
						ļ		
							<u> </u>	ļ
			<u> </u>			 	-	
						}	-	_
						!		<u> </u>

PCB Calibration Summary - Page 2

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	2/18/98-	2/22/98						
Time:	2/19/98	0237						
1	initial Cal	Cont. Cat.						
· · · · · · · · · · · · · · · · · · ·	%RSD	%D	·			-		
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Arocior 1242	ok							
Aroclor 1248	ok							
Aroclor 1254	ok							
Aroclor 1260	ok	ok						
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:		· 						
		<u> </u>		i				_
				·			· · · · · · · · · · · · · · · · · · ·	
	ļ			· · · · · · · · · · · · · · · · · · ·	<u> </u>			
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CORRECTED ANALYSIS SUMMARY FORMS

EPA SAMPLE NO.

K40584 ITS Environmental Lab Name: Lab Code: **WCHVT** 91082 Contract: Case: PCB SDG: FISH05 Phase Type: BIOTA 345983 Lab Sample ID: 10.0 Phase Weight: (g) 10/25/97 **Date Received:** 1.0 Injection Volume: (uL) 12/18/97 Date Extracted: 20.0 Dilution Factor: 02/21/98 Date Analyzed: 100 xxx 418198 (Y/N) % Solids: Y Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Arocior-1016	. 1000	W W	
11104-28-2	Aroclor-1221	1000	CN #	
11141-16-5	Arocior-1232	1000	The rest	
53469-21-9	Arocior-1242	1000	V W	
12672-29-6	Aroclor-1248	12000	2	
11097-69-1	Aroclor-1254	4600	7	
11096-82-5	Aroclor-1260	740	J	

						K40585	
Lab Name:	ITS Environmental		Lab Code:	INCHVT			
Contract:	91082	_ 	Case:	PCB	SDG:	FISH05	
Phase Type:	BIOTA	_		Lab Sample iO:	345984		
Phase Weight:	10.0	(g)		Date Received:	10/25/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/18/97		
Dilution Factor:	10.0	_		Date Analyzed:	02/21/98		
% Solids:	100 YPC AIRMY		-	Sulfur Clean-up:	Y		Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroctor-1016	500	W W	
11104-28-2	Aroclor-1221	500	LN R	
11141-16-5	Aroclor-1232	500	W W	
53469-21-9	Aroclor-1242	500	W &	
12672-29-6	Aroclor-1248	3800	7	
11097-69-1	Aroclor-1254	3000	7	
11096-82-5	Aroclor-1260	370	J	



							K40586	
į	Lab Name:	ITS Environmental		Lab Code:	INCHVT			
;	Contract:	91082	•	Case:	РСВ	SDG:	FISH05	
1	Phase Type:	ВЮТА			Lab Sample ID:	345985		
1	Phase Weight:	10.1	(g)		Date Received:	10/25/97		
الم	jection Volume:	1.0	(uL)		Date Extracted:	12/18/97		
l	Dilution Factor:	10.0			Date Analyzed:	02/21/98		
i	% Solids:	100 LPL A18198			Sulfur Clean-up:	Υ	(Y/I	V)

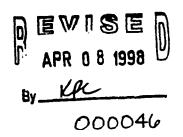
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	500	ZV X5	
11104-28-2	Aroclor-1221	500	A M	
11141-16-5	Aroclor-1232	500	W W	
53469-21-9	Aroclor-1242	500	m m	
12672-29-6	Aroclor-1248	7800	7	
11097-69-1	Aroclor-1254	3800	7	
11096-82-5	Aroclor-1260	500	U	

						K40587	
Lab Name:	ITS Environmental	-	Lab Code:	INCHVT	<u> </u>		
Contract:	91082	-	Case:	PCB	SDG:	FISH05	
Phase Type:	BIOTA	_		Lab Sample ID:	345986		
Phase Weight:	10.0	(g)		Date Received:	10/25/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/18/97		
Dilution Factor:	5.0			Date Analyzed:	02/21/98		
% Solids:	100 VEC AIX 198			Sulfur Clean-up:	Y	O	Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	A M
11104-28-2	Aroclor-1221	250	0 W
11141-16-5	Aroclor-1232	250	W W
53469-21-9	Aroclor-1242	250	R (C)
12672-29-6	Aroclor-1248	2000	2
11097-69-1	Aroclor-1254	1900	3
11096-82-5	Aroclor-1260	250	U

					K40595
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	РСВ	SDG:	FISH05
Phase Type:	BIOTA		Lab Sample ID:	345987	
Phase Weight:	10.0	(g)	Date Received:	10/25/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/18/97	
Dilution Factor:	10.0	_	Date Analyzed:	02/21/98	
% Solids:	100 2PC 418 198	_	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Arocior-1016	500	# 105	
11104-28-2	Aroclor-1221	500	W IL	
11141-16-5	Aroclor-1232	500	TW B	
53469-21-9	Arocior-1242	500	# W	
12672-29-6	Aroclor-1248	7500	7	
11097-69-1	Aroclor-1254	5600	2	
11096-82-5	Aroclor-1260	680	5	



EPA SAMPLE NO.

K40588

Contract:	91082	-	Case:	PCB	SDG:	FISH05
Phase Type:	BIOTA	_		Lab Sample ID:	345988	
Phase Weight:	10.1	(g)		Date Received:	10/25/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/18/97	
Dilution Factor:	5.0	_		Date Analyzed:	02/21/98	
% Solids:	100/PC 4/8/198	- -		Sulfur Clean-up:	Y	(Y/N)

Lab Code: INCHVT

ITS Environmental

Lab Name:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	THE VIEW
11104-28-2	Aroclor-1221	250	# W
11141-16-5	Aroclor-1232	250	# U
53469-21-9	Aroclor-1242	580	
12672-29-6	Arocior-1248	620	
11097-69-1	^ Arocior-1254	1900	
11096-82-5	Aroclor-1260	250	

EPA SAMPLE NO.

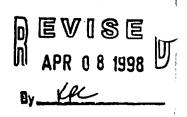
K40589 ITS Environmental Lab Name: Lab Code: INCHVT 91082 PCB FISH05 Contract: Case: SDG: Phase Type: **BIOTA** 345989 Lab Sample ID: Phase Weight: 10.0 (g) 10/25/97 **Date Received:** 1.0 Injection Volume: (uL) 12/18/97 Date Extracted: 2.0 **Dilution Factor:** 02/21/98 Date Analyzed: 100 KR 418198 % Solids: Y (Y/N) Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	TO W
11104-28-2	Aroclor-1221	100	# W
11141-16-5	Aroclor-1232	100	R 12
53469-21-9	Aroclor-1242	100	u w
12672-29-6	Aroclor-1248	1400	7
11097-69-1	Aroclor-1254	860	3
11096-82-5	Aroclor-1260	190	3

EPA SAMPLE NO.

						K40591	
Lab Name:	ITS Environmental		Lab Code:	INCHVT			
Contract:	91082		Case:	PCB	SDG:	FISH05	
Phase Type:	BIOTA			Lab Sample ID:	345991		
Phase Weight:	10.0	(g)		Date Received:	10/25/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/18/97		
Dilution Factor:	3.0			Date Analyzed:	02/21/98		
% Solids:	100 KAC 418198			Sulfur Clean-up:	Y	((Y/N)

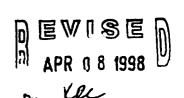
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	150	TJ W	
11104-28-2	Aroclor-1221	150	A M	
11141-16-5	Aroclor-1232	150	N (17)	
53469-21-9	Aroclor-1242	150	# 107	
12672-29-6	Aroctor-1248	\$20	7	
11097-69-1	Aroclor-1254	930	2	
11096-82-5	Aroclor-1260	150	TU 8	



000073

							K40592	
!	Lab Name:	ITS Environmental	_	Lab Code:	INCHVT		<u>-</u>]
!	Contract:	91082	-	Case:	PCB	SDG:	FISH05	
į	Phase Type:	ВІОТА	_		Lab Sample ID:	345992		
1	Phase Weight:	10.0	(g)		Date Received:	10/25/97		
'nje	ection Volume:	1.0	(uL)		Date Extracted:	12/18/97		
ב	Dilution Factor:	2.0	_		Date Analyzed:	02/21/98		
	% Solids:	108/12 4/8/99			Sulfur Clean-up:	Υ		Y/N)

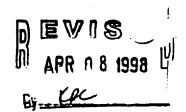
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	410
11104-28-2	Aroclor-1221	100	Q 10
11141-16-5	Aroclor-1232	100	# 10
53469-21-9	Aroclor-1242	100	V W
12672-29-6	Aroclor-1248	500	7
11097-69-1	Aroclor-1254	620	2
11096-82-5	Arocior-1260	100	K M



EPA SAMPLE NO.

			•		K40593
Lab Name:	ITS Environmental	Lab Code:	INCHVT		······································
Contract:	91082	Case:	PC8	SDG:	FISH05
Phase Type:	ATOIB		Lab Sample ID:	345993	
Phase Weight:	10.0	(g)	Date Received:	10/25/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/18/97	
Dilution Factor:	3.0		Date Analyzed:	02/21/98	
% Solids:	100 KR 418198		Sulfur Clean-up:	. Y	(Y/N)

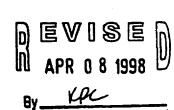
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	EN 4-
11104-28-2	Aroclor-1221	150	4 10
11141-16-5	Aroclor-1232	150	W (2)
53469-21-9	Arocior-1242	150	J. W.
12672-29-6	Aroclor-1248	560	7
11097-69-1	Aroclor-1254	650	7
11096-82-5	Aroclor-1260	180	7



000091

						K40594	
Lab Name:	ITS Environmental	_	Lab Code:	!NCHVT	<u> </u>		
Contract:	91082	-	Case:	РСВ	SDG:	FISH05	
Phase Type:	вюта	_		Lab Sample ID:	345994		
Phase Weight:	10.0	(g)		Date Received:	10/25/97		
Injection Volume:	1.0	(nr)		Date Extracted:	12/18/97		
Dilution Factor:	2.0	•		Date Analyzed:	02/21/98		
% Solids:	100 KAC HEME	_		Sulfur Clean-up:	Y	(Y/N)

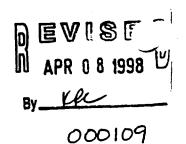
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	N W
11104-28-2.	Aroclor-1221	100	W W
11141-16-5	Aroclor-1232	100	8 V2
53469-21-9	Aroclor-1242	100	S R
12672-29-6	Aroclor-1248	650	7
11097-69-1	Aroctor-1254	640	2
11096-82-5	Aroclor-1260	100	y ar



EPA SAMPLE NO.

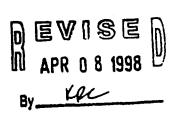
K40505 ITS Environmental Lab Name: Lab Code: INCHVT 91082 **PCB** FISH05 Contract: Case: SDG: **BIOTA** 345995 Phase Type: Lab Sample ID: 10.0 10/25/97 Phase Weight: (g) **Date Received:** 1.0 12/18/97 Injection Volume: (uL) Date Extracted: 20.0 02/21/98 **Dilution Factor:** Date Analyzed: 100 KPC 418148 Y Sulfur Clean-up: (Y/N) % Solids:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroctor-1016	1000	A IX
11104-28-2	Aroclor-1221	1000	<u>بي</u> لا
11141-16-5	Arocior-1232	1000	JJ tk
53469-21-9	Aroclor-1242	1000	D 8K
12672-29-6	Aroclor-1248	3300	:
11097-69-1	Aroclor-1254	6400	
11096-82-5	Aroclor-1260	1480	



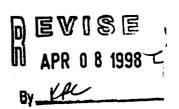
					K40596
Lab Name:	ITS Environmental	Lab Code:	INCHVT	<u> </u>	
Contract:	91082	Case:	РСВ	SDG:	FISH05
Phase Type:	BIOTA	_	Lab Sample ID:	346996	·
Phase Weight:	10.0	(g) _	Date Received:	10/25/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/18/97	
Dilution Factor:	1.0	_	Date Analyzed:	02/21/98	
% Solids:	200 YEL 418 M8		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIE	QUALIFIER	
12674-11-2	Aroctor-1016	50	78	7	
11104-28-2	Aroclor-1221	50	V	W	
11141-16-5	Aroclor-1232	50	8	W	
53469-21-9	Aroclor-1242	81		7	
12672-29-6	Arocior-1248	50	R	W	
11097-69-1	Aroctor-1254	230		7	
11096-82-5	Aroclor-1260	33	J		



					<40597
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	FISH05
Phase Type:	ВЮТА		Lab Sample ID:	345997	
Phase Weight:	10.0	(g)	Date Received:	10/25/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/18/97	
Dilution Factor:	1.0		Date Analyzed:	02/21/98	
% Solids:	100 CPC 418 198		Sulfur Clean-up:	Y	(Y/N)

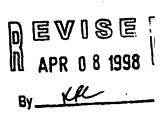
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	N D
11104-28-2	Aroclor-1221	50	W U5
11141-16-5	Aroclor-1232	50	w w
53469-21-9	Aroclor-1242	86	7
12672-29-6	Aroclor-1248	50	W 10
11097-69-1	Aroclor-1254	370	2
11096-82-5	Aroclor-1260	43	J



EPA SAMPLE NO.

						K40598
Lab Name:	ITS Environmental		Lab Code:	INCHVT		
. Contract:	91082	-	Case:	PCB	SDG:	FISH05
Phase Type:	ВЮТА			Lab Sample ID:	345998	
Phase Weight:	10.0	(g)		Date Received:	10/25/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/18/97	
Dilution Factor:	1.0			Date Analyzed:	02/21/98	
% Solids:	200 YPC A18198			Sulfur Clean-up:	Y	(Y/N)

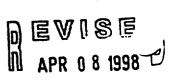
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	N W
11104-28-2	Aroclor-1221	50	20 4
11141-16-5	Aroclor-1232	50	A M
53469-21-9	Aroclor-1242	50	W &
12672-29-6	Aroclor-1248	50	TE VE
11097-69-1	Aroclor-1254	90	7
11096-82-5	Aroctor-1260	50	X (T)



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				K	40599
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	FISH05
Phase Type:	ВЮТА	_	Lab Sample ID:	345999	
Phase Weight:	10.0	(g)	Date Received:	10/25/97	
njection Volume:	1.0	(uL)	Date Extracted:	12/18/97	
Dilution Factor:	1.0		Date Analyzed:	02/21/98	
% Solids:	100 KPC 418 198		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	a ro	
11104-28-2	Aroclor-1221	50	IN 1/2	
11141-16-5	Aroclor-1232	50	A 10	
53469-21-9	Aroclor-1242	50	W 100	
12672-29-6	Aroclor-1248	68	3	
11097-69-1	Aroclor-1254	61	3	
11096-82-5	Aroclor-1260	50	- W	



AROCLOR ANALYSIS DATA SHEET

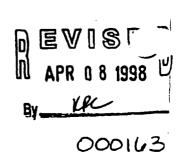
I UIVIN I

				. 1	K40600	
Lab Name:	ITS Environmental	Lab Code:	INCHVT	L		
Contract:	91082	Case:	PCB	SDG:	FISH05	
Phase Type:	BIOTA		Lab Sample ID:	346000		
Phase Weight:	10.0	(g)	Date Received:	10/25/97		
Injection Volume:	1.0	(uL)	Date Extracted:	12/18/97		
Dilution Factor:	5.0		Date Analyzed:	02/22/98		
% Solids:	200 XRC418198		Sulfur Clean-up:	Y	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	410
11104-28-2	Aroclor-1221	250	W W
11141-16-5	Aroclor-1232	250	A 10
53469-21-9	Aroclor-1242	250	# 10
12672-29-6	Aroclor-1248	380	7
11097-69-1	Aroclor-1254	880	7
11096-82-5	Aroclor-1260	160	J

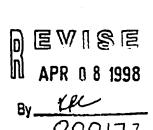
						K40601	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT			
Contract:	91082	-	Case:	PCB	SDG:	FISH05	
Phase Type:	BIOTA	_		Lab Sample ID:	346001		
Phase Weight:	10.0	(g)		Date Received:	10/25/97		
njection Volume:	1.0	(uL)		Date Extracted:	12/18/97		
Dilution Factor:	2.0	_		Date Analyzed:	02/22/98		
% Solids:	100 Klyiche	_		Suifur Cleanum	Y	(Y/N))

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Arocior-1016	100	-# W
11104-28-2	Aroclor-1221	100	W 100
11141-16-5	Aroclor-1232	100	JU 14
53469-21-9	Aroclor-1242	100	JU U.
12672-29-6	Aroclor-1248	200	7
11097-69-1	. Aroclor-1254	480	1 3
11096-82-5	Aroctor-1260	83	J



						K40602	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT		·	
Contract:	91082	-	Case:	PC8	SDG:	FISH05	
Phase Type:	ВЮТА	_		Lab Sample ID:	346002		
Phase Weight:	10.0	(g)		Date Received:	10/25/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/18/97		
Dilution Factor:	1.0	<u>.</u>		Date Analyzed:	02/22/98		
% Solids:	100 xec 4/8/98	_	•	Sulfur Clean-up:	Y		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# W
11104-28-2	Aroclor-1221	50	W W
11141-16-5	Aroclor-1232	50	CV IL
53469-21-9	Aroclor-1242	39	J
12672-29-6	Aroclor-1248	89	3
11097-69-1	Aroclor-1254	140	77
11096-82-5	Aroclor-1260	50	TU K



PERCENT LIPID ANALYSES

Percent Lipids Results

	T		
Sample ID	Lab_ID	<u> Matrix</u>	Result [*]
K40584	345983	tissue	14.0%
K40585	345984	tissue	8.8%
K40586	345985	tissue	10.0%
K40587	345986	tissue	3.0%
K40595	345987	tissue	14.8%
K40588	345988	tissue	5.3%
K40589	345989	tissue	1.6%
K40591	345991	tissue	1.1%
K40592	345992	tissue	0.5%
K40593	345993	tissue	1.3%
K40594	345994	tissue	2.2%
K40505	345995	tissue	20.6%
K40596	345996	tissue	0.2%
K40597	345997	tissue	0.3%
K40598	345998	tissue	0.1%
K40599	345999	tissue	0.2%
K40600	346000	tissue	0.6%
K40601	346001	tissue	0.4%
K40602	346002	tissue	0.2%

CHAIN OF CUSTODY



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO. PROJECT NAME 675,24,711 Kalamazau, River Resident Fish								Whole St. St. St. St. St. St. St. St. St. St.												
SAMPLER	8: (Signal	(ure)	1	1/				<u> </u>	Z.	31.	6	* (Med		//	///				
STA NO.	DATE	TIME	COMP.	GRAB		STAT	ION LOCATION			45		19;7 10%	*\ <u>``</u>	V //	//				REMARKS	
K40584	10/23/67	14:00		X	Planual	Dum	- Adult Car	φ	1	1	X	X	,			Fill	let.	carp	(skin - of	f) and lowing as discussed
K40525							 	<u> </u>		1	1	1				an-	lyze	- f.1	lets Foll	owing
K40586									4							- MM-	lytin	/	procedure	s discussed
K40587		_[_										П				pre	ンシン	5/4.		
K40595									A S							,				
K40533	L			1		مل			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		J	Ţ								
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6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO.							·		. 1.		1	77	7	///	7			
642.54.71	MPLERS: (Signator)						الها ـــــــا	- Whole / State / / / /										
SAMPLER	Kal Oghans							F	Fish West / / /									
STA. NO.	DATE	TIME	COMP.	GRAB		STAT	TON LOCATION		Whole State August 15 REMARKS									
K40539	19/23/97	14:00		X	Plann	Dom	- Adult Carp		1 1	XX				F.Ile	+ 6	carp	(skin-off) and
K40590								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						anal	, z c	fi	liets foll	wwing discussed
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Relinquish	ed by: (S	Signature)		DATE	TIME	Received by: (5	Signature)	Rel	inquished	by:	(Signaturi	9)	D	ATE	TIME	Reilnquished by	r: (Signatur a)
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6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO. PROJECT NAME 645.24.711 Kolomezoo River Resident Fish SAMPLERS: (Signature) a 1								Į -	hole			No.	·3/	7/		7					
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DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# FISH06

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH06 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

						Analyse	es	
Sample ID	Lab ID	Matrix	Sampling Date	VOA	BNA	РСВ	TAL	%LIPID
K40603	346026	tissue	10/14/97			х		x
K40604	346027	tissue	10/14/97			x		x
K40605	346028	tissue	10/14/97			x		×
K40606	346029	tissue	10/14/97			x		x
K40607	346030	tissue	10/14/97			x		x
K40608-C	346031	tissue	10/14/97			x		x
K40609-C	346032	tissue	10/23/97			x		×
K40610-C	346033	tissue	10/23/97	<u> </u>		×		×
K40611-C	346034	tissue	10/23/97			х		x
K40612-C	346035	tissue	10/23/97			x		×
K40582	346036	tissue	10/22/97			X		×
K40583	346037	tissue	10/22/97			x		x
K40534-C	346040	tissue	10/17/97			х		×
EB	346041	tissue		<u> </u>		x	<u></u>	x
K40613	346335	tissue	10/27/97			x		×
K40614	346336	tissue	10/27/97			х .		x
K40615	346337	tissue	10/28/97			x		×
K40616	346338	tissue	10/28/97			x		×
K40617	346339	tissue	10/28/97			×	<u> </u>	×
K40630-C	346340	tissue	10/28/97			x		x
K40631-C	346343	tissue	10/28/97			х		х
				<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

<u>Identification</u>

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for both surrogates were below control limits in samples K40612-C and K40617. The data for these samples have been qualified as estimated based on the recoveries. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X	-	
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		<u> </u>	
Holding Times			
Have any holding times been exceeded?		. <u>X</u>	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		X	
Matrix Spikes			
Is there a matrix spike recovery form present?		X	
Were matrix spikes analyzed at the required frequency?		X	
How many spike recoveries were outside of QC limits?			
NA out of NA			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
NA out of NA			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u> </u>	<u></u>	
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/reagent/instrument blanks have positive results?		x	
Do any field/rinse blanks have positive results?			X_
Are there field/rinse/equipment blanks associated with every sample?			X

PCB Data Review Checklist - Page 2

	YES	NO	NA
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X		4
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (less than 15%)?	X		·
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	X		·
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	-		X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	x		
Do the combined column and individual column Aroclor identifications agree?	<u>x</u>		
Were there any false negatives?		X	

PCB Data Review Checklist - Page 3

·	YES	NO	NA_
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limits	<u>s</u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?			X

90

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surr	ogates
		тсх	DCB
K40603			
K40604			
K40605			
K40606			
K40607			
K40608-C			
K40609-C			
K40610-C			
K40611-C			
K40612-C		ı	ı
K40582			
K40583			
K40534-C			
EB			
K40613			
K40614			
K40615			
K40616			
K40617		1	1
K40630-C			
K40631-C_			

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

پر Qualifiers:

Surrogates diluted out Recovery high Recovery low D

Unless otherwise noted, all parameters are within specified limits.

fsi

PCB Calibration Summary

Instrument: HP3327

Date:	1/28/98-	1/29/98	1/29/98	1/30	1/30	1/30	1/30	1/30
Time:	1/29/98	2156	2223	0349	0416	0942	1009	1646
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont Cal.
	%RSD	%D						
Aroclor 1016	ok							<u> </u>
Aroclor 1221	ok							<u> </u>
Aroclor 1232	ok							<u> </u>
Aroclor 1242	ok				ok		<u> </u>	<u> </u>
Aroclor 1248	ok	ok		ok				ok
Aroclor 1254	ok					ok	ok	<u> </u>
Aroclor 1260	ok		ok		<u> </u>			<u> </u>
Tetrachloro-m-xylene	ok				<u> </u>	<u> </u>		<u> </u>
Decachlorobiphenyl	ok						<u> </u>	<u> </u>
Affected Samples:								
								<u> </u>
	<u></u>							<u> </u>
								<u> </u>
	<u> </u>							
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PCB Calibration Summary - Page 2

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

1/28/98-	1/30/98						
1/29/98	1714						
Initial Cal.	Cont. Cal.			·			
%RSD	%D						
ok							
ok							
ok							
ok	<u> </u>						
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_	1/29/98 Initial Cal. %RSD ok ok ok ok ok ok	1/29/98 1714 Initial Cont. Cal. Cal. %RSD %D ok ok ok ok ok ok ok ok ok ok ok	1/29/98 1714 Initial Cont. Cal. %RSD %D ok ok ok ok ok ok ok ok ok o	1/29/98 1714 Initial Cont. Cal. Cal. SRSD %D ok ok ok ok ok ok ok ok ok o	1/29/98 1714 Initial Cont. Cal. Cal. SRSD %D ok ok ok ok ok ok ok ok ok o	1/29/98 1714 Initial Cont. Cal. %RSD %D ok ok ok ok ok ok ok ok ok o	1/29/98 1714 Initial Cont. Cal. Cal. Cal. Cal. Cal. Cal. Cal. Cal

CORRECTED ANALYSIS SUMMARY FORMS

FUKIVI 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

Y

(Y/N)

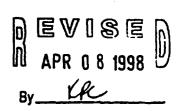
						K40603
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT	<u></u>	
Contract:	91082	_	Case;	РСВ	SDG:	FISH006
Phase Type:	BIOTA			Lab Sample ID:	346026	
Phase Weight:	10.0	(g)		Date Received:	10/25/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/29/97	
Dilution Factor:	2.0	_		Date Analyzed:	01/29/98	

% Solids:

100 KPC 418198

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	100	u
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	100	U
12672-29-6	Aroclor-1248	100	U
11097-69-1	Aroclor-1254	300	
11096-82-5	Aroclor-1260	57	j

Sulfur Clean-up:



EPA SAMPLE NO.

K40607

ITS Environmental Lab Name: Lab Code: INCHVT 91082 PCB FISH006 Contract: Case: SDG: Phase Type: **BIOTA** 346030 Lab Sample ID: Phase Weight: 10.1 (g) 10/25/97 **Date Received:** 1.0 Injection Volume: (uL) 12/29/97 **Date Extracted:** 2.0 01/30/98 **Dilution Factor:** Date Analyzed: 100 KEL A18199 Υ (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	99	U
11104-28-2	Aroclor-1221	99	U
11141-16-5	Aroclor-1232	99	Ū
53469-21-9	Aroclor-1242	99	U
12672-29-6	Aroclor-1248	99	U
11097-69-1	Aroclor-1254	420	
11096-82-5	Aroclor-1260	66	J



EPA SAMPLE NO.

K40608-C

ITS Environmental Lab Name: INCHVT Lab Code: 91082 PCB FISH06 Contract: Case: SDG: BIOTA Phase Type: 346031 Lab Sample ID: 10.0 Phase Weight: (g) 10/25/97 **Date Received:** 1.0 Injection Volume: (uL) Date Extracted: 12/29/97 5.0 01/30/98 **Dilution Factor:** Date Analyzed: 105 pt 418198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	U
11104-28-2	Aroclor-1221	250	Ü
11141-16-5	Aroclor-1232	250	υ
53469-21-9	Aroclor-1242	250	U
12672-29-6	Aroclor-1248	1600	
11097-69-1	Aroclor-1254	960	
11096-82-5	Aroclor-1260	180	J

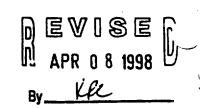


EPA SAMPLE NO.

K40609-C

Lab Name: ITS Environmental Lab Code: INCHVT 91082 PCB FISH06 Contract: Case: SDG: BIOTA Phase Type: 346032 Lab Sample ID: Phase Weight: 10.1 (g) 10/25/97 **Date Received:** 1.0 (uL) 12/29/97 Injection Volume: Date Extracted: **Dilution Factor:** 5.0 01/30/98 Date Analyzed: 100 ERC 45198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroctor-1016	250	U
11104-28-2	Aroclor-1221	250	U
11141-16-5	Arocior-1232	250	U
53469-21-9	Aroclor-1242	250	U
12672-29-6	Aroclor-1248	1700	
11097-69-1	Aroclor-1254	1300	
11096-82-5	Aroclor-1260	230	J

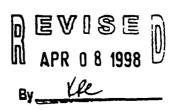


EPA SAMPLE NO.

K40610-C

ITS Environmental Lab Name: Lab Code: INCHVT 91082 **PCB** FISH06 Contract: SDG: Case: BIOTA Phase Type: 346033 Lab Sample ID: 10.0 10/25/97 Phase Weight: (g) Date Received: 1.0 12/29/97 Injection Volume: (uL) Date Extracted: 5.0 01/30/98 **Dilution Factor:** Date Analyzed: 100 xPC 418/98 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	U
11104-28-2	Arocior-1221	250	U
11141-16-5	Aroclor-1232	250	U
53469-21-9	. Aroclor-1242	250	U
12672-29-6	Aroclor-1248	1700	
11097-69-1	Aroclor-1254	1300	
11096-82-5	Aroclor-1260	220	J



EPA SAMPLE NO.

K40611-C

ITS Environmental INCHVT Lab Name: Lab Code: 91082 **PCB** FISH06 SDG: Contract: Case: **BIOTA** Phase Type: Lab Sample ID: 346034 10.0 10/25/97 Phase Weight: (g) Date Received: 1.0 12/29/97 Injection Volume: (uL) Date Extracted: 3.0 01/30/98 **Dilution Factor:** Date Analyzed: 100 KPC 418198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Arocior-1016	150	·U
11104-28-2	Arocior-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	Ú
12672-29-6	Aroclor-1248	1100	
11097-69-1	Aroclor-1254	1100	
11096-82-5	.Aroclor-1260	180	

000077

INCHVT

EPA SAMPLE NO.

K40612-C
SDG: FISH06

91082 PCB Contract: Case: **BIOTA** Phase Type: 346035 Lab Sample ID: 10.1 Phase Weight: (g) **Date Received:** 10/25/97 1.0 12/29/97 Injection Volume: (uL) **Date Extracted:** 3.0 01/30/98 **Dilution Factor:** Date Analyzed: 100 KPC 418168 (Y/N) Y % Solids: Sulfur Clean-up:

Lab Code:

ITS Environmental

Lab Name:

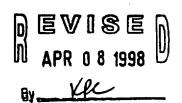
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	W W
11104-28-2	Aroclor-1221	150	8 W
11141-16-5	Aroclor-1232	150	W 105
53469-21-9	Aroclor-1242	150	8 10
12672-29-6	Aroclor-1248	570	7
11097-69-1	Aroclor-1254	500	2
11096-82-5	Aroclor-1260	84	J

EPA SAMPLE NO.

K40534-C

ITS Environmental INCHVT Lab Name: Lab Code: 91082 PCB FISH06 Contract: Case: SDG: BIOTA 346040 Phase Type: Lab Sample ID: 10.1 (g) 10/25/97 Phase Weight: **Date Received:** 1.0 (uL) 12/29/97 Injection Volume: **Date Extracted:** 3.0 01/30/98 **Dilution Factor:** Date Analyzed: 185 CPC 4/8/48 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	Ü
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroctor-1232	150	Ú
53469-21-9	Aroclor-1242	150	· U
12672-29-6	Aroclor-1248	900	
11097-69-1	197-69-1 Aroclor-1254		
11096-82-5	Aroclor-1260	200	



2215

EPA SAMPLE NO.

						K40613
Lab Name:	ITS Environmental		Lab Code:	INCHVT	L	
Contract:	91082		Case:	PCB	SDG:	FISH06
Phase Type:	BIOTA			Lab Sample ID:	346335	·
Phase Weight:	10.0	(g)		Date Received:	10/30/97	
Injection Volume:	1.0	(uL)		Date Extracted:	12/29/97	
Dilution Factor:	1.0			Date Analyzed:	01/30/98	
% Solids:	JOSKAL AISKIS			Sulfur Clean-up:	Υ	(Y/N)

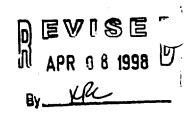
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Araclar-1016	50	U	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	. 50	U	
12672-29-6	Aroclor-1248	100		
11097-69-1	Aroclor-1254	90	1	
11096-82-5	Aroclor-1260	29	j	

EPA SAMPLE NO.

K40614

Lab Name: ITS Environmental INCHVT Lab Code: 91082 FISH06 **PCB** Contract: SDG: Case: **BIOTA** Phase Type: 346336 Lab Sample ID: 10.1 10/30/97 Phase Weight: (g) Date Received: 1.0 Injection Volume: (uL) 12/29/97 Date Extracted: 1.0 **Dilution Factor:** 01/30/98 Date Analyzed: 100 KR 418/48 % Solids: Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	Ü .	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	46	J	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	150		
11096-82-5	Aroclor-1260	50	U	



EPA SAMPLE NO.

K4G615

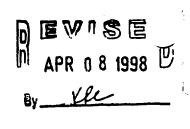
ITS Environmental Lab Name: Lab Code: INCHVT 91082 PCB FISH06 Contract: Case: SDG: BIOTA Phase Type: 346337 Lab Sample ID: 10.1 Phase Weight: (g) 10/30/97 **Date Received:** 1.0 12/29/97 (uL) Injection Volume: Date Extracted: 1.0 01/30/98 **Dilution Factor:** Date Analyzed: 100 ER 418198 (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	U	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	11097-69-1 Aroclor-1254		J	
11096-82-5	Aroclor-1260	50	U	

EPA SAMPLE NO.

				1	K40617
Lab Name:	ITS Environmental	Lab Code:	INCHVT	L	
Contract:	91082	_ Case:	PCB	SDG:	FISH06
Phase Type:	BIOTA	_	Lab Sample IO:	346339	
Phase Weight:	10.0	(g)	Date Received:	10/30/97	
Injection Volume:	1.0	_ (uL)	Date Extracted:	12/29/97	
Dilution Factor:	1.0	_	Date Analyzed:	01/30/98	
% Solids:	100 CRC 418 198	_	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER		
12674-11-2	Arocior-1016	50	DV SK		
11104-28-2	Aroclor-1221	50	D A		
11141-16-5	Aroclor-1232	50	an un		
53469-21-9	Aroclor-1242	50	Tr 1/2		
12672-29-6	Aroclor-1248	50	A 1/2		
11097-69-1	Aroclor-1254	40	J		
11096-82-5	Aroclor-1260	50	W &		



EPA SAMPLE NO.

K40630-C

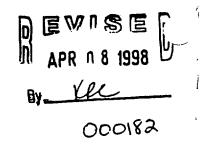
ITS Environmental Lab Name: Lab Code: INCHVT 91082 FISH06 PCB Contract: Case: SDG: BIOTA 346340 Phase Type: Lab Sample ID: 10.0 Phase Weight: (g) 10/30/97 **Date Received:** Injection Volume: 1.0 (uL) 12/29/97 Date Extracted: 1.0 Dilution Factor: 01/30/98 Date Analyzed: 200 CPC 418 148 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Arocior-1016	50	U	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	Ü	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	130		
11096-82-5	Aroclor-1260	39	J	

EPA SAMPLE NO.

				K+0631-	•
Lab Name:	ITS Environmental	Lab Code	: INCHVT		
Contract:	91082	Case	PCB	SDG: FISH	06
Phase Type:	BIOTA	_	Lab Sample ID:	346343	
Phase Weight:	10.0	(g)	Date Received:	10/30/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/29/97	
Dilution Factor:	1.0	_	Date Analyzed:	01/30/98	_ _
% Solids:	100 KRCAISHS	<u>.</u>	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	U	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	230		
11096-82-5	Aroclor-1260	43	J	



PERCENT LIPID ANALYSES

6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 448-9120

CHAIN OF CUSTODY RECORD

	PROJ. NO. 645.247// SAMPLER	K	GT HAN		River	Resulent Inch		12%	3 1 5 C / MARCH 19 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C		Street /			
	STA NO.	DATE	TIME	COMP.	GRAB	STA	TION LOCATION	/	H.S.	,	Br. Chap		//	REMARKS
K	40504-CA	ार्गार्भवा	14:0	X		New Richmond A	ASA#11 Juyanile 5m Bass			x	χ			Combine Kilosuilica with Kilosot-Ci(paraled ector)
K	40530-6	- -	_ _	_ _				\Box		17	11			Process all Juliante bus composite samples as
K	40531-6			Ц	_									whole-but composites and analyze filbury analytic
K	40532-0	<u></u>	16	1	_	<u></u>								Procedure cliscosted proximaly.
K	40533-C	10/11/91	10:0	x		Lake Megun ABS	A#9 Jevenle Sm Bus		; i!					1
K	40534-CI	n	D	<u> "</u>		11				1	1			Return C-1 to combine with 40534 (-2 which will fill
K	40535	जेगा भ	10'.00		X	Lala Allegan ABS	Alta Alvil Comp	1		x	X_{-}			Fillet carp (5kin-off fillels) and base (5kin-on
	Kyos3 L										7			Scules - on tilkts) and only so tillets tillming
•	K40537					•							1	analystical procedures discussed providing
	K40538													7 /
	1540539					V								·
į	K40540					Lala Alban ABS	A#9 Adult Pass		*	1/_				·
	K40541								1					
	K40592							1	My.					1
	Relinquish) B	in			DATE TIME		•				: (Signatu		DATE TIME Relinquished by: (Signature)
	Relinquish	ed by: (S	Signature)	,	. "			Rel	•		: (Signatu		DATE TIME Relinquished by: (Signature)
	Relinquist	ed by: (Signature)		DATE TIME	Received for Laboratory by: (Signature)		1		ite 3/97	11	TIME 1845	COPY ORIGINAL ON FILE



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

TEE. (510)	770-01																·
PROJ. NO. PROJECT NAME 145.14.711 Koloboo Rover Resident Fish								Whole Fish									
SAMPLERS: (Signature)																	
STA NO.	DATE	TIME	COMP.	GRAB		STATI	ON LOCATION				/%/ \/\^	``	///	//	/		REMARKS
KY0505	10 11 17	14:50		X	N. R. Amar	J Alut	Corp		702	X	X			Fillet	raio (ska-dl	fluts) and bess (Skin-on,
KY0516					Flammes (h	Coluit Bass			_1_				Sc	les-on	(mots)	and analyze fillets
K40597									44					Fullowing contest posedies			al appending discussed
KY0598								NA THE	TO S						arωnzβX I		
1110599					<u>.</u>			12						1		.	
K40600								機							•		
KY0601							:.										
K40603																	
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K40604		Ц							1								
K40805				$\ _{-}$				le d									
K40606	1			1				41.5 41.5					_ _				
X40607				<u></u>		<u>بل</u>			13.							<u>لر</u>	
K40608-		1	X		Plannell	0.m -	Juvenile Best Received by: (Signature)		., .,	+	+			Anel	<u> </u>		composite as directed dovre
Relinquie	:05	X.	_				Received by: (Signature)	,	Relia	nqui	ished by	y: (Sign	ature)		DATE	TIME	Relinquished by: (Signature)
Relinquished by: (Signature) Received by: (Signature) BATE TIME Received by: (Signature)							Relinquished by: (Signature) DATE TIME Relinquished by: (Signature)						Relinquished by: (Signature)				
Relinquished by: (Signature) DATE TIME Received for Laboratory by (Signature)						y:	TIME Remarks: COPY-UNIGINAL ON FILE SDG # FISHOS ETR & C7KI							IAL ON FILE SHOS ETR & C7/K1			
1/95	(~		_		Dl:	stribution: Original Accor	npanle	s S	```. :	Jopy	to Cod	ordinator	Fleid F	lles	-	



6723 Towpath Road, P.O. Box 66 Syracuse, New York 13214-0066 TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

I	PROJ. NO.	PROJE	OT NAM	E	_			_		ŀ		k		*/	//	//	//		
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	SAMPLER	8: (Signa	2del	o g	Ph.	De				12.	(5) A				//				
	STA NO.	DATE	TIME	COMP	GRAB		STATI	ON LOCATION					82/2						REMARKS
	lowy-c	19/23/17	13100	X		flugran	Ûn -	Twente Bes	\$			X	X			Anul	yze wh	ale - bad je	comparte samples fellowing
	1610-C			X						* \						MAG	stud 1	Meede	S discussad flownsiy
ز [456il- C			X							H						7	1	, ,
- 1	106.21-C.	1	1	X			\checkmark			1	12							J	
- 1	40582		17:50		1	Less Aller	سم_دار	tan gas			77					Fud	bass (S/S10-0	, xivs-on fillds) and
- 1	4055.3	"	1		X	"		"		13						analyze filets as chrocted above			
- 1	10334-0	и	4	X		Lule All	igen	Juvenile Das	3			I					Combai with sample 41534-51 and anapiec		
	11: 21·											·				1.160	la-la-la	amo.	seto sample 15 directed above
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BLASLAND & SOUCK SNOINEERS, P.C.

1	PROJ. N	10 0	ROJEC	TMA	ME		CHAIN	OF CUST	001	116	CON	, ,	,	, . , . ,				
	H524	711	Valer			ver NRMP	Resident Fish	NO.	. \			//	//		/			
	SAMPLER			3	12		/ /		///									
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		_ -,,,	×/,1	<u> </u>	·	· · · · · · · · · · · · · · · · · · ·		COM	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					//		REMARKS		
	STA. NO.	DATE	TIME	8	CAA	STATIC	ON LOCATION	TAINERS				//		′/				
	K10013		17:35			New Entread	Alut TO Poss		X	Z				Fillet (SKin-in, scules-on fillets) and				
	Kiknost	''	"		L.	١٠			1					analyze +	11.12 4	LINEAL SCALL TIL		
	K40ENS	10/24	4:37	1	1	maron Pord	Adult Sm Bass							porcelurs	disco	sel previously.		
	K436.F	1	1		1	1				7					i			
	1345617				1				1	1								
	141111	-K			_					_			1					
	K401.32.5	10/23	14:0	1		6.4% (vic)	Jeven's Ric)	メ	<u>K</u>				unstre	ما علالا	acty tillet souples		
<	12-18 Anh			2	İ	,,		• •	X	X				Edwar	Eduna analytical Assertates			
	4461.3Fi	214:1	,1,1	1		Buttle Cook ;	July Piese	1	X	X				discussed	Estimony analytical persectules discussed previously.			
	406320			7				1		I					1	7		
	40 F.S.C.		1	H				1-1	1						1			
	20 -4-01		1		-	V		1	1	V					/			
	106.55	10/27	<u> </u>	X/	λ	Battle Creek	: Adult Toos	1	×	X				Filet (si	hin . w	scale, - of) and		
þ.	13036	1	1		I	<u> </u>		1	1	1				con/y 75.	tille ?	to Activity - Iting		
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	hal stare 10/25/97 17:00														·			
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	Relinquished by: (Signature) Date / Time Received for Laborates						y by	Date / Time			ne.	Remarks						
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	Distribution Original Assembantes Shipmant; Copy to Coordinate						ter Field File			41	- 1 -	1						
					_													

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result
K40603	346026	tissue	0.1%
K40605	346028	tissue	0.3%
K40606	346029	tissue	0.3%
K40607	346030	tissue	0.2%
K40608-C	346031	tissue	2.0%
K40609-C	346032	tissue	1.6%
K40610-C	346033	tissue	1.9%
K40611-C	346034	tissue	1.7%
K40612-C	346035	tissue	1.7%
K40582	346036	tissue	0.2%
K40583	346037	tissue	0.2%
K40534-C	346040	tissue	1.6%
EB	346041	tissue	0.9%
K40613	346335	tissue	0.3%
K40614	346336	tissue	0.2%
K40615	346337	tissue	0.3%
K40617	346339	tissue	1.2%
K40630-C	346340	tissue	1.2%
K40631-C	346343	tissue	2.1%
		g.	

CHAIN OF CUSTODY

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# FISH07

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH07 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

·			Sampling				Analyses		
Sample ID	Lab ID	Matrix	Date	VOA	BNA	РСВ	TAL	%LIPID	
K40632-C	346344	tissue	10/29/97			×		x	
K40633-C	346345	tissue	10/29/97			×		×	
K40634-C	346346	tissue	10/29/97	<u> </u>		×		x	
K40635	346347	tissue	10/29/97	ļ		×		x	
K40636	346348	tissue	10/29/97			x		x	
K40637	346349	tissue	10/29/97			×		×	
K40368	346350	tissue	10/29/97			x		×	
K40639	346351	tissue	10/29/97			×		×	
K40623	346357	tissue	10/28/97			×		×	
K40624	346358	tissue	10/28/97		ļ	x		×	
K40625	346359	tissue	10/28/97	ļ		_x	ļ	x	
K40626	346360	tissue	10/28/97	ļ	<u> </u>		<u> </u>	хх	
K40627	346361	tissue	10/28/97			×		×	
K40628	346362	tissue	10/28/97	-		×		×	
				<u> </u>				 	
				-	<u> </u>	-			
							-		
				1	1	 	 	 	
						<u> </u>	<u> </u>	<u> </u>	

PCB ANALYSES

<u>Introduction</u>

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

g.ss

PCB Data Review Checklist

	YES	NO	NA_
Data Completeness and Deliverables			-
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	-
Holding Times			
Have any holding times been exceeded?		<u> </u>	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?		X	
If yes, were the samples reanalyzed?			x
Matrix Spikes			
Is there a matrix spike recovery form present?		X	
Were matrix spikes analyzed at the required frequency?		X	
How many spike recoveries were outside of QC limits?			
NA out of NA			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
NA out of NA			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?	·		X
Are there field/rinse/equipment blanks associated with every sample?			x

PCB Data Review Checklist - Page 2

Calibration and GC Performance Are the following chromatograms and data printouts present? Aroclor 1016/1260 X X X X X X X X X X X X X X X X X X X		YES	NO	NA_
present? Aroclor 1016/1260 X Aroclor 1221 X Aroclor 1232 X Aroclor 1242 X Aroclor 1248 X Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor	Calibration and GC Performance			
Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? X Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor	- · · · · · · · · · · · · · · · · · · ·			
Aroclor 1232 X Aroclor 1242 X Aroclor 1254 X Aroclor 1254 X Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? X Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? X Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? X Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? X Was the proper analytical sequence followed? X Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? X PCB Identification Is both a combined and single column Aroclor	Aroclor 1016/1260	<u> </u>		
Arcolor 1248 Arcolor 1254 Arcolor 1254 Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? X Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor	Aroclor 1221	<u> </u>		
Aroclor 1248 Aroclor 1254 Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? X Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor	Aroclor 1232	<u> </u>		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? X Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? X PCB Identification Is both a combined and single column Aroclor	Aroclor 1242	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence? Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? X Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? X PCB Identification Is both a combined and single column Aroclor	Aroclor 1248	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD) Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? X Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? X PCB Identification Is both a combined and single column Aroclor	Aroclor 1254	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard? Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor		X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed? Are %D values for all compounds within limits (less than 15%)? **Analytical Sequence Check** Is a analytical sequence form present and complete for each column and each period of analyses? **Was the proper analytical sequence followed? **Cleanup Efficiency Verification** If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? **PCB Identification** Is both a combined and single column Aroclor**		X		
Are %D values for all compounds within limits (less than 15%)? Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor		X		
Analytical Sequence Check Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor		X		
Is a analytical sequence form present and complete for each column and each period of analyses? Was the proper analytical sequence followed? Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? Y PCB Identification Is both a combined and single column Aroclor	· · · · · · · · · · · · · · · · · · ·	X		
each column and each period of analyses? Was the proper analytical sequence followed? Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor	Analytical Sequence Check			
Cleanup Efficiency Verification If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor		x		
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor	Was the proper analytical sequence followed?	X		
Chromatography Check Form present? Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor	Cleanup Efficiency Verification			
the efficiency of the cleanup procedure within QC limits? PCB Identification Is both a combined and single column Aroclor		*****		x
Is both a combined and single column Aroclor	the efficiency of the cleanup procedure within QC	x	-	
_ ·	PCB Identification			
		x		
Do the combined column and individual column Aroclor identifications agree?		<u>x</u>		
Were there any false negatives?X	Were there any false negatives?		X	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limits	<u>s</u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?		<u> </u>	X

PCB Holding Time and Surrogate **Recovery Summary**

Sample ID	Holding Time	Surro	gates
		тсх	DCB
K40632-C			
K40633-C			
K40634-C			
K40635			
K40636			
K40637			
K40638			
K40639			
K40623			
K40624			
K40625			
K40626			
K40627			
K40628			
			
			
			·
			

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

\$35

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	2/18/98-	2/19/98	2/19/98	2/20	2/20	2/20	2/20	2/23
Time:	2/19/98	1957	2023	0141	0207	0725	0751	1202
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont.
	%RSD	%D	%D	%D	%D	%D	% D	%D
Aroclor 1016	ok							
Arocior 1221	ok							
Arocior 1232	ok							
Aroclor 1242	ok						ok	
Aroclor 1248	ok	ok		ok		ok		ok
Aroclor 1254	ok		ok					
Aroclor 1260	ok				ok			
Tetrachloro-m-xylene	ok	l						
Decachiorobiphenyl	ok							
Affected Samples:								
		<u> </u>						

ok					
				1	
				·	
	<u></u>	<u> </u>	<u> </u>		

2324

PCB Calibration Summary - Page 2

Instrument: <u>HP3327</u> Column: <u>RTX-35 / RTX-5</u>

Date:	_	2/23/98	2/23/98	2/23				
Time:		1229_	1745	1812				
•	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016		ļ				 		
Aroclor 1221								
Aroclor 1232								
Aroclor 1242								
Aroclor 1248			ok					
Aroclor 1254		ok						
Arocior 1260		-		ok				
Tetrachioro-m-xylene		ļ						
Decachlorobiphenyl								
Affected Samples:								
	·			_				
				Α.				1

CORRECTED ANALYSIS SUMMARY FORMS

INCHVT

PCB

Date Extracted:

Date Analyzed:

Sulfur Clean-up:

Lab Code:

(g)

(uL)

Case:

ITS Environmental

91082

BIOTA

10.05

1.0

1.0

186 KRC 418/18

Lab Name:

Contract:

Phase Type:

Phase Weight:

Injection Volume:

Dilution Factor:

% Solids:

EPA SAMPLE NO.

VΤ	1	K40632-C1			
PCB	SDG:	FISH07			
Lab Sample ID:	346344				
Date Received:	10/30/97	<u> </u>			

(Y/N)

02/03/98

02/19/98

Y

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Arocior-1242	50	Ü
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	260	
11096-82-5	Aroclor-1260	67	

EPA SAMPLE NO.

K40633-C1

ITS Environmental Lab Name: INCHVT Lab Code: 91082 PCB FISH07 Contract: Case: SDG: BIOTA 346345 Phase Type: Lab Sample ID: 10.09 (g) Phase Weight: Date Received: 10/30/97 Injection Volume: 1.0 (uL) 02/03/98 Date Extracted: 1.0 Dilution Factor: 02/20/98 Date Analyzed: 100 LPC 415198 (Y/N) Y % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Arocior-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	210	
11096-82-5	Aroclor-1260	45	J

				K4	0634-C1
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	FISH07
Phase Type:	BIOTA		Lab Sample ID:	346346	
Phase Weight:	10.01	(g)	Date Received:	10/30/97	
Injection Volume:	1.0	(uL)	Date Extracted:	02/03/98	
Dilution Factor:	1.0		Date Analyzed:	02/20/98	
% Solids:	100 KRC 418198		Sulfur Clean-up:	Y	(Y/N)

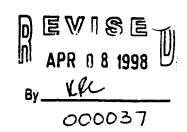
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Arocior-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	160	
11096-82-5	Aroclor-1260	38	J

EPA SAMPLE NO.

K40635

Lab Name:	ITS Environmental	Lab Code	: INCHVT		<u> </u>
Contract:	91082	Case	PCB	SDG:	FISH07
Phase Type:	BIOTA	_	Lab Sample ID:	346347	
Phase Weight:	10.07	(g) _	Date Received:	10/30/97	
Injection Volume:	1.0	(uL)	Date Extracted:	02/03/98	
Dilution Factor:	1.0	_	Date Analyzed:	02/20/98	
% Solids:	100 KPC 418198	- -	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Arocior-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	75	
11096-82-5	Aroclor-1260	50	U



				}	(40636	
Lab Name:	ITS Environmental	Lab Code:	INCHVT			
Contract:	91082	Case:	PC8	SDG:	FISH07	
Phase Type:	BIOTA		Lab Sample ID:	346348		
Phase Weight:	10.10	(g)	Date Received:	10/30/97		
Injection Volume:	1.0	(uL)	Date Extracted:	02/03/98		
Dilution Factor:	1.0		Date Analyzed:	02/20/98		
% Solids:	100 LPL 418198		Sulfur Clean-up:	Y	((Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	46	J
11096-82-5	Aroclor-1260	50	U

				H	(40637
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	РСВ	SDG:	FISH07
Phase Type:	ВІОТА	_	Lab Sample ID:	346349	
Phase Weight:	10.08	(g)	Date Received:	10/30/97	
njection Volume:	1.0	(uL)	Date Extracted:	02/03/98	
Dilution Factor:	1.0	_	Date Analyzed:	02/20/98	
% Solids:	100 KR. AIGIGE	-	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	52	
11096-82-5	Aroclor-1260	50	U

					K40638
Lab Name:	ITS Environmental	Lab Code:	INCHVT	<u> </u>	
Contract:	91082	Case:	РСВ	SDG:	FISH07
Phase Type:	ВІОТА	_	Lab Sample ID:	346350	
Phase Weight:	10.10	(g)	Date Received:	10/30/97	
Injection Volume:	1.0	(uL)	Date Extracted:	02/03/98	
Dilution Factor:	1.0	_	Date Analyzed:	02/20/98	
% Solids:	100 yac 4/8/98	-	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Arocior-1016	50	Ü
11104-28-2	Aroclor-1221	50	Ū
11141-16-5	Aroclor-1232	50	U
53469-21-9	Arocior-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	27	J
11096-82-5	Aroclor-1260	50	Ū



EPA SAMPLE NO.

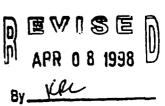
K40639

ITS Environmental Lab Name: Lab Code: INCHVT 91082 PCB FISH07 SDG: Contract: Case: BIOTA Phase Type: 346351 Lab Sample ID: 10.08 Phase Weight: (g) 10/30/97 **Date Received:** 1.0 (uL) 02/03/98 Injection Volume: **Date Extracted:** 1.0 02/20/98 **Dilution Factor:** Date Analyzed: 100 th AKISS Υ (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	50	U
11096-82-5	Aroclor-1260	43	J

			·			K40623	
Lab Name:	ITS Environmental		Lab Code:	INCHVT	<u> </u>		
Contract:	91082		Case:	PCB	SDG:	FISH07	·
Phase Type:	BIOTA			Lab Sample ID:	346357		_
Phase Weight:	10.1	(g)		Date Received:	10/30/97		_
'njection Volume:	1.0	(uL)		Date Extracted:	02/03/98		_
Dilution Factor:	1.0			Date Analyzed:	02/23/98		_
% Solids:	100 xfc 418458			Sulfur Clean-up:	Y		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	48	J
11096-82-5	Aroclor-1260	50	U



EPA SAMPLE NO.

K40624 ITS Environmental INCHVT Lab Code: Lab Name: 91082 **PCB** FISH07 Contract: Case: SDG: BIOTA 346358 Phase Type: Lab Sample ID: 10.09 (g) 10/30/97 **Phase Weight: Date Received:** 1.0 (uL) 02/03/98 Injection Volume: Date Extracted: 1.0 02/23/98 Dilution Factor: Date Analyzed: 100 KPC 418/98 Υ (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Arocior-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	80	
11096-82-5	Aroclor-1260	50	U

EPA SAMPLE NO.

K40625 ITS Environmental Lab Name: INCHVT Lab Code: 91082 PCB Contract: FISH07 Case: SDG: **BIOTA** Phase Type: Lab Sample 10: 346359 10.01 Phase Weight: (g) **Date Received:** 10/30/97 1.0 Injection Volume: (uL) Date Extracted: 02/03/98 1.0 02/23/98 **Dilution Factor:** Date Analyzed: 100 KBL 418 198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	ŭ
53469-21-9	Aroctor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	50	U
11096-82-5	Aroctor-1260	27	J

			٠			K40626	
Lab Name:	ITS Environmental	La	b Code:	INCHVT			_
Contract:	91082		Case:	РСВ	SDG:	FISH07	
Phase Type:	BIOTA			Lab Sumple ID:	346360		
Phase Weight:	10.07	(g)		Date Received:	10/30/97		
njection Volume:	1.0	(uL)		Date Extracted:	02/03/98		
Dilution Factor:	1.0			Date Analyzed:	02/23/98		
% Solids:	100 KR 415198			Sulfur Clean-up:	Y	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	U	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	50	U	
11096-82-5	Aroclor-1260	50	U	

					K40627
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	FISH07
Phase Type:	ВЮТА		Lab Sample ID:	346361	
Phase Weight:	10.10	(g)	Date Received:	10/30/97	
njection Volume:	1.0	(uL)	Date Extracted:	02/03/98	
Dilution Factor:	1.0		Date Analyzed:	02/23/98	
% Solids:	100 xAC 418198		Sulfur Clean-up:	Υ	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Arocior-1016	50	U	
11104-28-2	Arocior-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	37	J	
11096-82-5	Aroclor-1260	50	U	

			•		<40628
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	FISH07
Phase Type:	BIOTA	_	Lab Sample ID:	346362	
Phase Weight:	10.02	(g)	Date Received:	10/30/97	
Injection Volume:	1.0	(uL)	Date Extracted:	02/03/98	
Dilution Factor:	1.0	_	Date Analyzed:	02/23/98	
% Solids:	100 KRC 418198		Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	U	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	Ú	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	56		
11096-82-5	Aroclor-1260	50	U	

PERCENT LIPID ANALYSES

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Percent Lipids Results

			
Sample ID	Lab ID	Matrix	Result
K40632-C	346344	tissue	1.4
K40633-C	346345	tissue	1.8
K40634-C	346346	tissue	1.7
K40635	346347	tissue	0.7
K40636	346348	tissue	0.8
K40637	346349	tissue	0.4
K40638	346350	tissue	0.4
K40639	346351	tissue	0.4
K40623	346357	tissue	0.3
K40624	346358	tissue	0.9
K40625	346359	tissue	0.5
K40626	346360	tissue	0.3
K40627	346361	tissue	0.6
K40628	346362	tissue	0.2

CHAIN OF CUSTODY

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SAMPLES	111	Relan	1620	וא	ver NRMP Resident Fish	- NO.	13	£/		/ /	/ /	
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ETA. NO.	DATE	TIME	8	GRAB	STATION LOCATION	TAINERS	/	₩			//	
K40613	10/27	14:20		۷.	NEW Richmond Adult SM Base	1	X	X				Fillet (SKin-on, scales-on fillets) and
K16614	"	11		<u> "</u>	17	1_1_	1	1				analyze fillets tellowing analytical
K40615	10/28	4:30	<u> </u>	1	Morrow Pond Adult Sm Asss		\prod					procedures discussed previously.
K40616	<u> </u>	L <i>L</i> _		LL.	\							, , , , , , , , , , , , , , , , , , , ,
1540617	1	مر		1		1	1	بر				
K40630-0	10/23		1	_	B. Hle Crok Juvaile Rose	11	X	X			_ _	analyze whole-budy fillet samples
< 40631-CI		"	1		· ·		X	X			_ _	tellowing analytical pocerlates
49063FC	21429	11:20	V		Pottle Creek : Juv. 8-55		X	X			_ _	discussed proviously
K 40632-	1 10/29		4				Ш	\perp			_ _	
K 40633.c	19/21	Ш_	\coprod	<u> </u>			Ш	\perp				
K40634-C1	10/29	J.	<u> </u>		V	V	1	<u>\dagger</u>				<u> </u>
K 40635	10/27	12:00	X/	ス	Battle Creek: Adult Boss	1	X	X				Fillet (skin-on, seales-off) and analytics
K 40636					1.8			1_				analyze fillets following analytics
K 40637	J	1		V	V	V	4	6				proceedings discussed previously
Relinquish	od by:	signatura dans	,	10	Date / Time Received by: 15-phatur.	•1	Aelia	nquisi	hed by	y: 15.gn	esurel	Date / Time Received by: /Signature/
Relinquish	ed by: /	Signa lura	j		Date / Time Received by: /Signature	01	Relic	quist	ned by	r: /Signi	envel	Date / Time Received by: (Signature)
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SDG # FISHOL ETR # 67213



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140620								Ш	Ц					_DOCE	lives d	escussed Graviols/
K406-1								Ц	Ц					/		1
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1540625								Ш		_						
K40626				Ш				Ш					_	 		
KYOLAT				Ш				Ш	_	_			_			
K406-4K				Ш				\coprod		_			_			-
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Relinguish	ed by: 1				Date / Time	Received for Laborator (Supnature)	1		P	7 / Ti	me 1993		mark	8		
		Dist	-	M. D.	ignal Accompanies	Shipment; Copy to Coordina	tor Field Frie	•								

BLASLAND & BO SHOINEIRS, P.C.

CHAIN OF CUSTODY RECORD PROJ. NO. PROJECT NAME 645.24.711 Kalemazoo Diver NRMP Res. Fish Whole SAMPLERS: (Signature) OF REMARKS CON-TAINERS STA. NO. DATE STATION LOCATION 10 40638 1921 12:00 X Bittle Coast : Ad. Sm. Brss Fillet (seiles off, skinds) and analyze tillets following K 40639 analytical proforms discusse Date / Time Relinquished by: (Signatura) Received by: (Signature) Relinquished by: (Signature) Date / Time Received by: /Signatural 10/29/97 17110 Date / Time Received by: (Signature) Relinquished by: (Signatural Date / Time Received by: (Signature) Date / Time Remarks Received for Laboratory by: Date / Time Relinquished by: (Signature) (Signature) Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# FISH08

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc. Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH08 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

						Analyse		
Sample ID	Lab ID	Matrix	Sampling Date	VOA	BNA	РСВ	TAL	%LIPID
K40640	347199	tissue	11/10/97			x		×
K40641	347200	tissue	11/10/97			x		x
K40642	347201	tissue	11/10/97			x	!	×
K40643	347202	tissue	11/10/97			×		x
K40644	347203	tissue	11/10/97	<u> </u>		x		х
K40645	347204	tissue	11/10/97			×		x
K40646	347205	tissue	11/10/97			х		x
K40647	347206	tissue	11/10/97			x		×
K40648	347207	tissue	11/10/97			×		×
K40649	347208	tissue	11/10/97	<u> </u>		×		×
K40650	347209	tissue	11/10/97			×		×
K40651	347210	tissue	11/10/97	<u> </u>		x		x
			<u> </u>	<u> </u>			ļ	ļ
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PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

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Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for one surrogate was below control limits in samples K40640, K440641, K40643 and K40645. Since recoveries for the remaining surrogate were within control limits, no data has been qualified based on the deviations. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

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PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	X	•	
If yes, were the samples reanalyzed?		X	
Matrix Spikes			
Is there a matrix spike recovery form present?		X	
Were matrix spikes analyzed at the required frequency?		X	
How many spike recoveries were outside of QC limits?			
NA_ out of NA_			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
NA out of NA			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			X_
Are there field/rinse/equipment blanks associated with every sample?			x

PCB Data Review Checklist - Page 2

	YES	NO	NA
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u> </u>		
Aroclor 1221	<u> </u>		
Arocior 1232	X		
Arocior 1242	X		
Aroclor 1248	<u> </u>		
Aroclor 1254	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check			
is a analytical sequence form present and complete for each column and each period of analyses?	X		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?			x
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			•
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?			
Were there any false negatives?		X	

PCB Data Review Checklist - Page 3

	YES	NO	NA_
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Limit	<u>s</u>		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X	•	
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Were field duplicates submitted with the samples?			X

		_
)

PCB Holding Time and Surrogate **Recovery Summary**

Holding Time	Surro	gates
	TCX	DCB
	<u> </u>	
		:
	<u> </u>	
	_ 4	
	:	
		
		
		TCX i

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Surrogates diluted out Recovery high Recovery low D

Unless otherwise noted, all parameters are within specified limits.

		•
)

PCB Calibration Summary

Instrument: <u>HP3327</u> Column: RTX-35 / RTX-5

Date:	1/28/98-	1/30/98	1/30/98	1/30	1/30	1/31	1/31	
Time:	1/29/98	1646	1714	2118	2145	0310	0337	
1	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	
	%RSD	%D	%D	%D	%D	%D	%D	
Aroclor 1016	ok							
Aroclor 1221	ok							
Arocior 1232	ok							<u>.</u>
Aroclor 1242	ok				ok			
Aroclor 1248	ok	ok		ok		ok		
Aroclor 1254	ok						ok	
Aroclor 1260	ok		ok					
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok		<u></u>					
Affected Samples:								
						-		-
		·						

			<u> </u>	
			_	
			_	

CORRECTED ANALYSIS SUMMARY FORMS

				} 1	K40640
Lab Name:	ITS Environmental	Lab Code	: INCHVT		
Contract:	91082	Case	e: PCB	SDG:	FISH08
Phase Type:	вюта	•	Lab Sample ID:	347199	
Phase Weight:	10.1	(g)	Date Received:	11/11/97	
njection Volume:	1.0	(uL)	Date Extracted:	12/29/97	
Dilution Factor:	1.0		Date Analyzed:	01/30/98	
% Solids:	200 KFC 417148	•	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	60	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	46	J
11096-82-5	Aroclor-1260	50	U

EPA SAMPLE NO.

		K40641	
- -	SDG:	FISH08	
): _	347200		
t:	11/11/97	•	
l: _	12/29/97	·	

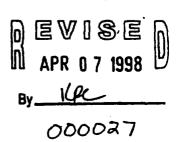
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT	<u></u>	•
Contract:	91082	_	Case:	РСВ	SDG:	FISH08
Phase Type:	вюта	_		Lab Sample ID:	347200	
Phase Weight:	10.0	(g)		Date Received:	11/11/97	
njection Volume:	1.0	(uL)		Date Extracted:	12/29/97	
Dilution Factor:	1.0			Date Analyzed:	01/30/98	
% Solids:	195 CR 41748			Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	58	
11096-82-5	Aroctor-1260	50	U

DEVISE N APR 0 7 1998 T By KRC 000018

	-				K40643
Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	PCB	SDG:	FISHOR
Phase Type:	BIOTA	_	Lab Sample ID:	347202	
Phase Weight:	10.1	 (g)	Date Received:	11/11/97	
'njection Volume:	1.0	(uL)	Date Extracted:	12/29/97	
Dilution Factor:	1.0	_	Date Analyzed:	01/30/98	
% Solids:	100 484 1198	_	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Arocior-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	73	
11096-82-5	Arocior-1260	30	J



EPA SAMPLE NO.

K40644

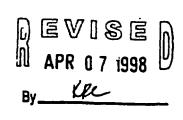
Lab Name: **ITS Environmental** Lab Code: INCHVT 91082 PCB FISH08 SDG: Contract: Case: BIOTA 347203 Phase Type: Lab Sample ID: 10.1 (g) 11/11/97 Phase Weight: **Date Received:** 1.0 (uL) 12/29/97 Injection Volume: **Date Extracted:** 1.0 01/30/98 **Dilution Factor:** Date Analyzed: 100 KR 41198 Y (Y/N) % Solids: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	Ü
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	60	
11096-82-5	Aroclor-1260	50	U

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						K40645	
Lab Name:	ITS Environmental	_ 14	ab Code:	INCHVT	L		
Contract:	91082	-	Case:	PCB	SDG:	FISH08	_
Phase Type:	BIOTA	_		Lab Sample ID:	347204		
Phase Weight:	10.1	(g)		Date Received:	11/11/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/29/97		
Dilution Factor:	1.0	_		Date Analyzed:	01/30/98		
% Solids:	100 KPC ANKY			Sulfur Clean-up:	Y	(Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Arocior-1248	50	U
11097-69-1	Aroctor-1254	39	J
11096-82-5	Aroclor-1260	50	U

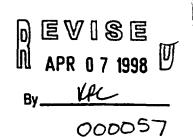


EPA SAMPLE NO.

K40646

					i	1/40040	
Lab Name:	ITS Environmental	_	Lab Code:	INCHVT			
Contract:	91082	-	Case:	PC8	sog:	FISH08	
Phase Type:	BIOTA	_		Lab Sample ID:	347205		
Phase Weight:	10.0	(g)		Date Received:	11/11/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/29/97		
Dilution Factor:	1.0			Date Analyzed:	01/30/98		
% Solids:	100 KR 417/48	•		Sulfur Clean-up:	Y	(Y/I	N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	u	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	73		
11096-82-5	Aroclor-1260	50	U	



						K40647	
· Lab Name:	ITS Environmental	-	Lab Code:	INCHVT	L		
Contract:	91082	-	Case:	PCB	SDG:	FISHOR	<u></u>
Phase Type:	ВІОТА			Lab Sample ID:	347206		
Phase Weight:	10.1	(g)		Date Received:	11/11/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/29/97		
Dilution Factor:	1.0			Date Analyzed:	01/30/98		
% Solids:	100 xle 417198			Sulfur Clean-up:	Y		(Y/N)

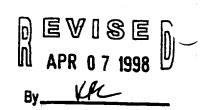
CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	U	
11104-28-2	Aroclor-1221	50	Ü	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	ป	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	94		
11096-82-5	Aroclor-1260	29	J	

EPA SAMPLE NO.

K40648

Lab Name:	ITS Environmental	Lab Code:	INCHVT	<u> </u>	
Contract:	91082	Case:	PCB	SDG:	FISH08
Phase Type:	BIOTA	_	Lab Sample ID:	347207	
Phase Weight:	10.0	(g)	Date Received:	11/11/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/29/97	
Dilution Factor:	1.0	_	Date Analyzed:	0 1/3 0/98	
% Solids:	100 KK 4748	_	Sulfur Clean-up:	Y	(Y/N)
		=	-		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	υ	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	79		
11096-82-5	Aroclor-1260	37	J	



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						K40649	
Lab Name:	ITS Environmental	-	Lab Code:	INCHVT			,
Contract:	91082	-	Case:	PCB	SDG:	FISH08	
Phase Type:	BIOTA	_		Lab Sample ID:	347208		
Phase Weight:	10.0	(g)		Date Received:	11/11/97		
Injection Volume:	1.0	(uL)		Date Extracted:	12/29/97		
Dilution Factor:	1.0	_		Date Analyzed:	01/30/98		
% Solids:	100 KR 411/98	•		Sulfur Clean-up:	Y		(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	Ü	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclor-1248	50	U	
11097-69-1	Aroclor-1254	35	J	
11096-82-5	Aroclor-1260	50	U	

EPA SAMPLE NO.

K40650

Lab Name:	ITS Environmental	Lab Code:	INCHVT		
Contract:	91082	Case:	РСВ	SDG:	FISH08
Phase Type:	ВЮТА	_	Lab Sample ID:	347209	
Phase Weight:	10.1	(g)	Date Received:	11/11/97	
Injection Volume:	1.0	(uL)	Date Extracted:	12/29/97	
Dilution Factor:	1.0		Date Analyzed:	01/31/98	
% Solids:	100 KR 417/198	•	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER	
12674-11-2	Aroclor-1016	50	U	
11104-28-2	Aroclor-1221	50	U	
11141-16-5	Aroclor-1232	50	U	
53469-21-9	Aroclor-1242	50	U	
12672-29-6	Aroclar-1248	50	U	
11097-69-1	Aroclor-1254	200		
11096-82-5	Aroclor-1260	66		

				K40651			
Lab Name:	ITS Environmental	Lab Code:	INCHVT				
Contract:	91082	Case:	РСВ	SDG:	FISH08		
Phase Type:	BIOTA	_	Lab Sample ID:	347210			
Phase Weight:	10.0	(g)	Date Received:	11/11/97			
Injection Volume:	1.0	(uL)	Date Extracted:	12/29/97			
Dilution Factor:	1.0	_	Date Analyzed:	01/31/98			
% Solids:	100 yes 411/48	•	Sulfur Clean-up:	Y	(Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	Ü
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	47	J
11096-82-5	Aroclor-1260	50	U

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab (D	Matrix	Result'
K40640	347199	tissue	0.7%
K40641	347200	tissue	0.6%
K40643	347202	tissue	0.7%
K40644	347203	tissue	0.4%
K40645	347204	tissue	0.5%
K40646	347205	tissue	0.9%
K40647	347206	tissue	1.3%
K40648	347207	tissue	0.7%
K40649	347208	tissue	0.3%
K40650	347209	tissue	1.5%
K40651	347210	tissue	0.7%

CHAIN OF CUSTODY



CHAIN OF CUSTODY RECORD

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64524	ווד	Kal	ame	120	RIVER NAMP Rosidat Fish	M	0.	17	70,		3/				//	•	
SAMPLER	PS: Isipoi	lure)		1	In Al] 。) F	13,	,	\16°	7 . /	/ /	/ /				
		/all/ha		108ha	ر [DN-		37. 18. 18. 18. 18. 18. 18. 18. 18. 18. 18			////				REMARKS		
STA. NO.	DATE	TIME	8	3775	STATION LOCATION	TAI	HERS			69	× /	//	//				
K40640	1/10/97	14:00		X	Ceresco Res - Carp	-		ン	X					Filet (SKin	-dl f.	llets) and englyze
K40641	1	1		1	\	1		ī	l					Ellet	£.1	lowine	analytical procedures
K40642				П			<u> </u>		\prod					discus	sail	Diex	ws//-
K40643									Ш							/	'7
K40644		\Box					L	Ш									
K40645				\coprod				Ш	Ш			_					
K40646			<u> </u>			Ц		Ш	Ш								
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Relinquished by: (Signature) Date / Time Received for Laboratory by: Date / Time Registrics																	
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